INTERPERSONAL PLAY AND COMMUNICATION BETWEEN YOUNG AUTISTIC CHILDREN AND THEIR MOTHERS

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DECLARATION

I declare that this thesis is composed by me

and that this work is my own.

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ABSTRACT

Following a brief introduction to autism and the history of its recognition, a review of the literature is presented covering current models of this condition and empirical studies on play and communication in normal development and in autism. This leads to the conclusion that research into interpersonal play and communication, integrating the contributions of both child and mother are more promising than many of the approaches that have been used so far about the study of play and communication in autism.

Identification of autistic, developmentally-delayed and normally developing children was made by means of Subject Selection Inventories (SSIs) developed by the researcher and presented, for the autistic group, to mothers throughout the U.K. Mother-child interaction in the home was video recorded. In two studies, selected portions of the video-record were subjected to microanalysis to analyse interpersonal play and communication.

Study A involves 3 groups with 7 dyads in each group. A verbal autistic group consisting of 4- to 6-year-old verbal autistic children playing with their mothers was compared to groups of developmentally-delayed and non-developmentally-delayed children with their mothers. The groups were matched on language development (Reynell Developmental Language Scales), sex and mother's education; the autistic and the delayed children were also matched on chronological age. In Study B, 2 groups of 6 dyads and 7 dyads respectively were compared. The latter group was the same as the verbal autistic group in Study A. The former group consisted of 3- to 6-year-old autistic children functioning at a pre-verbal level of development.

Important findings of Study A are, as follows: the verbal autistic children were capable of symbolic play; they rarely pointed, asked for help or information, gave positive replies and laughed or smiled; the mothers initiated a high frequency of approaches when there was in fact no interpersonal communication.

In Study B, pre-verbal autistic children, in comparison, were found to lack 'instrumental' and 'symbolic' play; they and their mothers exhibited a different pattern of communicative expressions compared to the verbal group, but their 'Interpersonal Engagement' had some similarities to that of the verbal group.

The implications of these findings for understanding the psychological nature of autism and for improving communication between mothers and their autistic children, are discussed.

CONTENTS

TABLES

[1] Tables 6.1 - 6.30 refer to Study A.

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[2] Tables 6.31 - 6.57 refer to Study B.

DIAGRAMS

FIGURES

CHAPTER 1 INTRODUCTION

Recently, most research concerning autism has concentrated on the investigation of an impaired 'theory of mind' in autistic individuals. This cognitive approach, tested with experiments and including autistic children who can speak and understand language, unfortunately does not facilitate understanding of the autistic disorder as it affects most of the children in real life and does not clarify the difficulties they all show at the level of interpersonal contact. This thesis was designed as a departure from the cognitive approach to be a study of interpersonal aspects of communication during play between young autistic children with different abilities and their mothers. Before the aims of the thesis are presented in full, the autistic syndrome and its definition will be described in a historical perspective[1].

1. KANNER'S DESCRIPTION OF AUTISM AND VARIATIONS SINCE 1943

In etymology, the word 'autism' is made up of a combination of two Greek words -- 'aut-', which means self, and '-ism', which implies 'orientation or state'. So, autism could be defined as the condition of somebody who is absorbed in him- or her- self (Reber, 1985). The contemporary conception of autism and its cause has been described by Gillberg (1990). "Autism is now best regarded as a syndrome defined by certain behavioural features, with multiple aetiologies, but possibly with specific pathogenic mechanisms involving dysfunction of particular groups of neurons in the central nervous system." -- (Gillberg, 1990, p. 209).

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[1] Part of this historical review has been presented in two publications:

a) Papoudi, D. (1991). Childhood autism: Developmental failure of symbolic play? IN: G. Kugiumutzakis (Ed.), *Progress in Developmental Psychology of the First Years.* Crete: Crete University Press, and

b) Aitken, K.J., Papoudi, D., Robarts, J.Z. and Trevarthen, C. (1993). *Children with Autism: Diagnosis, Prevalence in Scotland and Interventions to Meet their Needs.* Edinburgh: Scottish Education Department/Edinburgh Centre for Research in Child Development.

Early epidemiological studies reported a prevalence rate of 4.5 children per 10,000 (Lotter, 1966), then more recent ones, using a broader definition of autism, report that as many as 10 in every 10,000 children may be affected by autism and 30 to 50 children may show milder problems on the same spectrum (Bryson et al, 1988). Clearly it is a rare disorder but the exact numbers of children identified as autistic depends on the features taken to define the syndrome (see below).

The male-female ratio is now taken to be 2-3 : 1 (Wing, 1981) or 2.5 : 1 (Bryson et al, 1988), although earlier studies reported a ratio of 4.3 : 1 (Rutter and Lockyer, 1967), with the possibility that the females, though fewer, are more severely affected (Tsai et al, 1981; Bryson et al, 1988). Although autism was previously considered to be more common in families with superior socio-economic status, intelligence and education (Lotter, 1967), later work finds that it is not associated more with any specific social class (Wing, 1980).

A majority of autistic children function in the mentally retarded range. Those in the autistic spectrum who show near normal mental abilities are usually labelled as Asperger's syndrome (Gillberg and Gillberg, 1989). About two thirds are so handicapped in various ways that they are unable to care for themselves (DeMyer et al, 1973). The prognosis for future capacity correlates with the degree of mental handicap and language impairment (Rutter et al, 1967).

Definitions of autism have changed considerably over the past 50 years. Kanner (1943) made the first clear and comprehensive description of the condition, which he called 'early infantile autism'. He interpreted it as a disturbance of affective contact. Descriptions of isolated cases in the late eighteenth century and early nineteenth century, such as the 'wild boy of Aveyron' and Kaspar Hauser, are now believed to represent early examples of Kanner's syndrome (Frith, 1989).

Bleuler (1913) used the term 'autism', before Kanner, but in a somewhat different sense. He defined the thought of schizophrenics as autistic because it corresponds not to reality and logic, but to fantasy. However, in this sense autistic thinking can also appear in normal people in whom it has an accommodative role. Only if a functional balance between 'autism' and 'realism' is lost does a pathological form of behaviour emerge. It seems that the main difference between Kanner's (1943) and Bleuler's (1913) descriptions lies in the assumed innateness (or not) of the social withdrawal in autism and the role of fantasy. Kanner suggested that the root cause is an innate inability to develop relationships with people, while Bleuler argued that there is an acquired withdrawal from social relationships in the course of development. Furthermore, Kanner described the autistic person's lack of imagination, while Bleuler emphasized the role of fantasy in the autistic thinking that he associated with schizophrenia.

Later, with the influence of psychoanalytic theory, the term 'infantile autism' came to imply both an assumed normal phase of development and a type of childhood psychosis (Mahler, 1952). During the phase of what Mahler calls 'normal autism', from birth until the second month of life, the infant is described as being unable to differentiate between him/herself and outside reality. Pathological autism (infantile autism) is then described as being the consequence of a fixation or regression to the primarily normal autistic stage; the child cannot orient him/herself to the outside world, so he/she is restricted to his/her own world (Mahler, 1976). Tustin (1981) has a similar approach. She explains autism in terms of the sensations of a normal phase in infancy, in which the child, intimately and inseparably attached to the mother's body, cannot differentiate between him/herself and the not-self (mother). If a disturbance of the development of the process of 'individuation' occurs, the infant reacts by developing pathological autism. Anthony (1958), also argues that autism occurs in every infant as a developmental phase and psychopathology emerges only if the child is bound to, or returns to, the normal autistic period. Piaget used the term 'egocentricity', which can also be interpreted as normal autism (Anthony, 1958; Tustin, 1981). However, in Piaget's theory the emphasis is on

general cognition or perhaps on perception, rather than, as with the psychoanalysts, on interpersonal 'object relation' and its emotional regulation.

The term 'autism' has, in fact, been used in so many different senses that a precise description of individual characteristics is now considered essential to avoid confusion between different tacit definitions. 'Autistic infantile psychosis' (Mahler, 1952), 'childhood schizophrenia' (Wolff and Chess, 1964), 'autism' (Tustin, 1981), 'autistic disorder' (DSM-III-R, 1987) are used as synonyms for the syndrome that Kanner first described as 'early infantile autism'. The most often followed descriptions of autism are briefly summarized below.

In Kanner's original paper (1943) the main characteristics of autistic children's behaviour are presented as:

- an inability to establish social relatedness
- failure to use language normally for the purpose of communication
- obsessive desire for the maintenance of sameness
- fascination for objects and
- good cognitive potentialities.

It is noteworthy that Kanner subsequently reduced the essential features of the autistic syndrome to two:

- the aloneness and
- the obsessive desire for sameness (Eisenberg and Kanner, 1956).

Ornitz and Ritvo (1968) classified the symptoms of early infantile autism into five sub-clusters: disturbances of perception, motor behaviour, relating, language, and developmental rate and sequence. Sub-cluster 1, the inability to maintain constancy of perception, is considered to dominate all the others.

Rutter, who has maintained for the last two decades the view that 'childhood autism' is primarily a disorder of 'cognitive processing', proposed the following diagnostic criteria in 1978:

- onset before the age of 30 months
- impaired social development that has a number of special characteristics and is out of keeping with the child's intellectual level
- delayed and deviant language development that has certain defined features and is out of keeping with the child's intellectual level
- insistence on sameness as shown by stereotyped play patterns, abnormal preoccupations and resistance to change.

In the Ninth Revision of the International Classification of Diseases (ICD-9, 1978), infantile autism is recorded among 'the psychoses with an origin specific to childhood'. The diagnostic criteria for 'infantile autism' are specified as follows:

- onset before 30 months
- deviant social development
- abnormalities of language development
- restricted and abnormal stereotyped patterns of behaviour.

The American Psychiatric Association publishes the Diagnostic and Statistical Manual of Mental Disorders (DSM) which has been revised many times. In the first editions only the term 'childhood schizophrenia' appeared. However, in the last revisions (1980, 1987), autism is classified under 'pervasive developmental disorders'.

In DSM-III (1980), 'infantile autism' is diagnosed on the basis of the following:

- onset before 30 months
- pervasive lack of responsiveness to other people
- gross deficits in language development
- if speech is present, peculiar patterns
- bizarre responses to various aspects of the environment
- absence of delusions, hallucinations, loosening of association and incoherence, as seen in schizophrenia.

In DSM-III-R (1987), the diagnosis of 'infantile autism', now called 'autistic disorder', sets aside the age of onset. When the criteria are not met for 'autistic disorder', 'schizophrenia', or 'schizotypal' or 'schizoid personality disorder' and an individual exhibits impaired reciprocal social interaction and impaired verbal and non-verbal communication, the category of 'pervasive developmental disorder not otherwise specified' (PDD) is used. A diagnosis of 'autistic disorder' includes the following criteria:

- impairment in reciprocal social interaction
- impairment in verbal and non-verbal communication and in imaginative activity
- restricted repertoire of activities and interests, and
- onset during infancy or childhood.

A study in 1986 by Kistner and Robbins found that Rutter's criteria (Rutter, 1978) were then generally viewed as the most objective; in studies published between 1971 and 1982, 25% cited Rutter's criteria, 21% National Autistic Society's (1978) and 15% DSM-I or -II or -III. DSM-III-R is undergoing further revision and the new version, DSM-IV will be published in 1993. DSM-III-R has been criticized for not promoting a precise definition of the condition, which, as mentioned above, results in classification of twice as many children as autistic when compared to DSM-III (Hertzig et al, 1990; Volkmar et al, 1992) and ICD-10 (Volkmar et al, 1992). It describes a much broader and less severely impaired clinical population (Demb and Weintraub, 1989).

2. Autism and Human Understanding

This brief literature review has shown that conflicting concepts about the nature of autism are reflected in the various diagnostic systems devised since Kanner first described 'infantile autism'. Confusion extends to a disagreement among professionals (to be further discussed in Chapter 2) over the extent to which the primary disorder is socio-emotional or cognitive/meta-cognitive.

Kanner (1943) claimed that autistic children ". . . have come into the world with innate inability to form the usual, biologically provided

affective contact with people, just as other children come into the world with innate physical or intellectual handicaps." -- (Kanner, 1943, p. 250).

Rutter, who for years had argued that autism is generated from a core disorder of cognition, has more recently suggested that it is primarily a deficit in social and emotional functioning that is associated with faulty cognitive processes. He has expressed this change of view as follows:

> ". . . we are forced to the conclusion that autistic children's social abnormalities do stem from some kind of 'cognitive' deficit, if by that one means a deficit in dealing with social and emotional cues . . . it appears that the stimuli that pose difficulties for autistic children are those that carry emotional or social 'meaning'." -- (Rutter, 1983, p. 528).

The view that autism is a primary disorder of meta-cognition claims support from recent demonstrations that autistic children fail in some tasks that test for a 'theory of mind'. Autistic children are seen as unable to acquire 'interpersonal perspective taking' (Baron-Cohen et al, 1985).

Despite the disagreements over the diagnosis of autism and concerning the nature of the primary deficit, for practical purposes the socio-emotional dysfunctions remain a key-feature of the behaviour of autistic people. 'Theory of mind' problems can only be tested in older speaking children who can understand and use language to discuss their thoughts and beliefs, but autism is a disorder that manifests itself before a child can speak, and many older autistic children who do not speak and have reduced language comprehension are untestable by this method. It follows that ". . . if autism is to be recognized in infancy, the focus has to be shifted from the typical speech/language problems to abnormal perceptual responses and various social dysfunctions." -- (Gillberg et al, 1990, p. 933). This clarifies the need to examine more closely how autistic people interact with others by both verbal and non-verbal means, and especially how they behave with those who care for them every day.

The interests of the scientific literature concerned with autism have moved far from Kanner's description of autism of almost fifty years ago. However, our increasing knowledge of normal development in the

early years of life, and recent findings concerning the communicative and affective behaviours of children with autism show that it is still necessary to study, as central, the interpersonal and affective aspects of this disorder which Kanner thought were crucial. If attention is directed only to the perceptual or cognitive characteristics of the child acting alone, the condition he identified cannot be understood.

3. The Aims of this Research

This thesis has been designed to address almost all the interactive behaviours appearing during play of young autistic children with their mothers. It proceeds as follows:

- Current models of understanding autism will be reviewed, and an alternative proposal based upon evidence from normal development observed in mother-infant and mother-child studies will be discussed. Another review of the literature will be presented to cover available instruments for identifying autism, and empirical studies on play and communication in normal development and in autism[2].
- Autistic children are often regarded in empirical studies as one group, when, in fact, they have a wide range of behaviours and abilities. Here an attempt is made to define behavioural characteristics of different participant groups and to assure homogeneity of the groups with an appropriate screening instrument.
- In the early stages, the aim of the study was to compare a young autistic group with appropriate matched comparison groups of developmentally-delayed and non-delayed children using detailed video analysis. However, after the first data collection, it was found that verbal and pre-verbal autistic children function in play and communicative behaviours at different levels. It was decided, therefore, to treat verbal and pre-verbal children as separate analytical groups and to carry out two separate studies to compare patterns of play and communication between the participant groups.

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2 Parts of the literature review have been presented in the publications mentioned in the previous footnote.

The first study included verbal autistic children matched with developmentally-delayed and non-delayed children on a verbal test; the second study included the verbal autistic children, participating in the first study, and pre-verbal autistic children.

- The interaction between children and mothers was recorded with video equipment. Close observation of the video tapes showed that a new detailed coding instrument should be developed specifically for these studies to cover all behavioural aspects of interpersonal contact during play in the dyad.
- There is some confusion in the literature over the capacity of autistic children for play, and especially for 'symbolic' play. The present thesis sets out, by means of an exhaustive coding scheme, to define a social framework for studying play, to classify play categories and to provide detailed information on interpersonal play.
- The study of communication in autistic children is generally one-sided. Here a coding system has been developed to examine thoroughly communication in a two-sided system -- the behaviours of both mother and child, and their interactions are analysed.

4. Overview of Thesis

A review of current models of autism and empirical studies on play and communication in normal development and in autism is given as a background to the design of a research plan (Chapter 2). The presentation of a pilot study (Chapter 3) is followed by a discussion of how participants with defined behavioural and intellectual characteristics were selected and by a description of the data collection procedure used in the Main Study (Chapter 4). A coding instrument for the analysis of the video observation will be discussed and applied to the corpus of videos (Chapter 5). This coding will be the basis for the statistical analysis (Chapter 6) and the final interpretation of the findings (Chapter 7). The implications of the results for understanding the psychological nature of autism and for improving communication between mothers and their autistic children will be examined (Chapter 7). An attempt to incorporate the findings of the present study into a broader theoretical framework concludes this thesis (Chapter 8).

CHAPTER 2 PLAY AND COMMUNICATION IN NORMAL DEVELOPMENT AND IN AUTISM

Since Kanner described autism, the literature attempting to explain this condition has explored a number of concepts. These can be divided into two main groups: the first identifying organic causes or features, and the second pointing to non-organic or psychological aspects of functioning. There are many articles and books written on the subject, but the aim of this literature review is not to report all the contributions of the two conceptual groups. Extended reviews of research can be found in the articles of Rutter (1968), DeMyer, Hintgen and Jackson (1981) and in a report to the Scottish Office composed by Aitken, Papoudi, Robarts and Trevarthen (1993).

Organic theories are supported by evidence that abnormal brain growth, pathological brain cells and tissues, abnormal physiology in the brain and neuro-chemical abnormalities are associated with autism and can be implicated in its aetiology. It has also been found that other medical conditions are linked to autism such as genetic abnormalities, phenylketonuria, maternal contraction of rubella during pregnancy, epilepsy, tuberous sclerosis, abnormalities of purine metabolism and melanin (Aitken et al, 1993).

Non-organic theories concerned with impairments of a psychological nature, will be reviewed briefly, with emphasis on current theories and empirical studies relating to play and communication. Studies on play, communication and communicative play of normally developing children and autistic individuals, both high and low functioning, will be examined. The conclusion is that our present knowledge of the interpersonal aspects of development for autistic people is poor. Recent advances in understanding of intersubjective processes in the normal development of play and communication will form the basis of an alternative psychological model.

1. Rival Psychological Theories of Autistic Behaviour

Leo Kanner (1943) believed first that all symptoms of autism stem from an innate inability for interpersonal contact. Later he considered that experiential factors combine with innate ones to produce the clinical picture of autism (Eisenberg and Kanner, 1956). Having first argued that autism is a disorder of affective contact originating in the child, he was persuaded that the emotional characteristics of the mother, with a possible link to high intelligence and upper social class of the parents, could contribute to the genesis of autism.

Even if it is decided that there is an innate cause of autism, the fundamental question as to whether autism is primarily caused by a cognitive or an affective deficit remains unresolved. Is it at base an emotional illness, or is it the result of faulty sensations, perceptions or reasoning? There is a historical progress in the development of psychological theories regarding autistic pathology, but in recent years the debate has been mainly between the cognitive and the affective theories.

Many authors influenced by the psychoanalytic theory of emotional trauma in infancy, citing evidence for the emotional dependency and need for affection of the young child, consider the social/emotional environment to be crucial in the aetiology of autism. They have suggested that mothers may be responsible for their children's autism (Bettelheim, 1967) and even Kanner, at a later stage, described parents of autistic children as 'refrigerators' (Kanner, 1949). Thus, autism has been taken to be a consequence of negative interactions with the parents, or maternal deprivation, or emotional stress originally suffered by the mother and then transmitted to the child. An alternative more cautious opinion is that parental coldness may support the development of autism in a child with a weakness of this kind (Eisenberg and Kanner, 1956), or that a combination of unresponsive child and unresponsive mother exists where autism appears (Anthony, 1958). However, studies have repeatedly failed to support this environmental or psychogenic approach (McAdoo and DeMyer, 1978). It is important to acknowledge that a child developing autistic behaviour, whatever the cause, will be a

great strain and worry for parents, will certainly affect their emotions, and may threaten their emotional health (Aitken et al, 1993).

From the point of view of ethologists, specialists in animal communication and social relationships, motivation for approach or withdrawal from social contact with other individuals and for picking up the signals that regulate communication, is critical (Tinbergen and Tinbergen, 1983). Autism is seen by the Tinbergens as an imbalance of motivation and emotion dominated by anxiety, and they, with the psychoanalysts and attachment theorists, think the intrusiveness of the human environment toward the child must be a key factor in its cause. Anxiety, they feel, causes social withdrawal and consequent failure to learn and benefit from social interaction. Avoidance behaviour from social interactions and gaze aversion are viewed as the main characteristics of autistic social behaviour (Richer and Coss, 1976; Richer, 1978). Holding therapy has been developed as an application of the Tinbergens' theory in order to overcome the supposed anxious avoidance (Zappella et al, 1991).

Assuming that the disorder stems from a cognitive deficit, Hermelin and O'Connor (1970) claimed that autistic children's inability to recode stimuli meaningfully underlies the social impairment. Tilton and Ottinger (1964) suggested that autistic children's inability to see relationships between objects might contribute to their failure to develop social skills. Rutter and his collaborators (Bartak et al, 1977; Rutter, 1983) also argued forcefully that a cognitive deficit is the basis of autism. It has been suggested that the central problem is an impairment of the ability to comprehend and to use symbols, (Ricks and Wing, 1975), or to form symbols (Hammes and Langdell, 1981). Studies on the acquisition of language and on 'functional' and 'symbolic' play in autistic children support the idea that a major impairment is in symbol formation (Ungerer and Sigman, 1981; Sigman and Ungerer, 1984a). Recently, deficits in executive function, i.e. ". . . the ability to maintain an appropriate problem-solving set for attainment of a future goal. . . " which ". . . includes behaviours such as planning, impulse control, inhibition of prepotent but irrelevant responses, set maintenance, organized search, and flexibility of thought and action." -- (Ozonoff,

Pennington and Rogers, 1991, p. 1083) have been taken to be fundamental (Ozonoff, Pennington and Rogers, 1991).

In the last few years, the social deficit in autism has been explained on the basis of a hypothetical meta-cognitive mechanism that performs thinking about thinking, the 'theory of mind'. The 'theory of mind' is hypothesized to be an innate cognitive capacity, which manifests itself in the second year of life and accounts for children's engagement in 'pretend' play (Leslie, 1987). This cognitive capacity is also manifested in ostensive communication, ". . . something broader than just pointing and showing: namely, any act in which one person places a stimulus in the environment of another person for purposes of communication and which achieves communication by directing attention." -- (Leslie and Happé, 1989, p. 206), or is manifested in intentional communication (Leslie, 1991), or in gestural communication including pointing to draw someone's attention to an object (Baron-Cohen, 1989a) and joint attention (Baron-Cohen, 1991a). According to this theory, autistic children have the ability for 'first-order representations' of other persons and objects, but they are unable to form 'second-order representations', i.e. they cannot attribute beliefs to others, or have a mind about other minds. This deficit is taken to constitute the main feature of the disorder (Baron-Cohen et al, 1985; Leslie and Frith, 1988; Baron-Cohen, 1989b). Further studies have supported the 'theory of mind' deficit in autism by showing that autistic children have problems in understanding false beliefs (Baron-Cohen et al, 1985; Perner et al, 1989), true beliefs (Leslie and Frith, 1988), beliefs and desires of other people (Harris, 1989), event sequences in psychological-intentional terms (Baron-Cohen et al, 1986), emotion caused by beliefs (Baron-Cohen, 1991b) and deception (Russell et al, 1991; Baron-Cohen, 1992; Sodian and Frith, 1992), and in distinguishing mental from physical entities and appearance from reality (Baron-Cohen, 1989c).

The theory of meta-cognition is a rational one that would separate the mind from the body. It ignores bodily expressions of emotion, vocalizations, facial expressions, gestures and body movements, which are laden with information about self-other awareness (Hobson, 1990a, 1990b). Klin, Volkmar and Sparrow (1992)

mention that if impairment in 'pretend' play, pointing and joint attention account for autistic children's social dysfunction, one should not expect social abnormalities before the 8th month of life, since these behaviours appear at different ages after the 8th month in normal development. However, this is contradictory to Kanner's description, which defined autism as an impairment in affective contact since birth. He wrote that "The outstanding, 'pathognomic', fundamental disorder is the children's inability to relate themselves in the ordinary way to people and situations from the beginning of life." -- (Kanner, 1943, p. 242). On the basis of findings that autistic children lack basic and early emerging social behaviours (such as eye contact with the caregiver, response to human voices, interest in novel objects and in children, expression of emotions, imitation, participation in games etc), as these behaviours are measured on the Vineland Adaptive Behaviour Scales (Sparrow et al, 1984), Klin, Volkmar and Sparrow (1992) concluded that:

> ". . . autistic social deficits are both pervasive and "primary" (i.e. occur early in the developmental sequence), rather than being circumscribed to social behaviours mediated by meta-representational skills, or "secondary" to a cognitive impairment presumably apparent in the last quarter of the first year of life, as predicted by the Theory of Mind hypothesis." -- (Klin et al, 1992, p. 871).

There is a second debate about the extent to which a visual or spatial or perceptual role-taking ability is a prerequisite for the differentiation between the child's 'self' and another person. This is critical for our understanding of the 'theory of mind' because role-taking abilities reflect the degree of awareness and sensitivity toward the thoughts and feelings of other persons (Hobson, 1984). In a study formulated in the frame of Piagetian cognitive theory, autistic children were not found to be impaired in their ability for self-recognition (Dawson and McKissick, 1984). However, in other cases where autistic children did fail to recognize their self-images, this failure can be interpreted as evidence of a general developmental delay, and not as a deficit indicative of the autistic syndrome (Ferrari and Matthews, 1983). Furthermore, Hobson (1984) showed that autistic children were able to appreciate others' points of view in a visuo-spatial setting just as well as

non-autistic children who had an equivalent IQ. Baron-Cohen (1989a), an adherent of the 'theory of mind' approach, replicated Hobson's experiment and accepted that perceptual role-taking is not a precursor to the impaired 'theory of mind' seen in autism.

These studies, in opposition to the 'theory of mind' theory, suggest that autistic children are, in fact, able to differentiate between self and other. Further evidence that the development of rational thinking is not a prerequisite for differentiating between 'self' and 'other' as a separate being comes from findings that infants only minutes old can imitate a partner (Kugiumutzakis, 1985).

It now seems likely that autistic children's varied impairment in imitation (DeMyer et al, 1972; Curcio, 1978; Ohta, 1987), which correlates with the degree of impairment in social relating (Dawson and Adams, 1984), is part of the social deficit, an aspect of the overall impairment in communication, and not that both result from a deficiency in meta-cognition or any other general aspect of 'thinking' (Rogers and Pennington, 1991; Nadel and Pezé, 1993). It seems likely that a fundamental inability to form an internal image of the other who can be a partner in truly reciprocal interaction, with whom the child can explore how to share orientations to objects, exchange feelings about actions and events and cooperate in performance of tasks, would undermine consciousness of persons and impair all kinds of social learning.

In opposition to the 'theory of mind' hypothesis, Hobson (1986a, 1986b) claimed that the observed social impairment in autism is created by an inability to respond emotionally to others. He explained cognitive and language deficits in autistic children as developmental consequences of failures in interpersonal or intersubjective relatedness, which are biologically based (Hobson, 1989a, 1989b). He rejected the 'theory of mind' theory, arguing that, ". . . children do not develop, nor do they need, a 'theory' about the mental life of others. What children acquire is knowledge that other people have minds." -- (Hobson, 1990a, p. 199). For the acquisition of this knowledge there is, according to Hobson, a pathway of three stages that one must follow: first, a person acquires a concept of self; second, the individual establishes relatedness between himself and the others by means of observing others' bodily expressions;

and third, he develops a relation based on analogy between his subjective experiences and the others' bodily appearances (Hobson, 1990a). Hobson (1990b) also disagrees with the claim that autistic children are able to form first-order representations, such as perception and expression of emotions, and social-affective responsiveness. He suggests that autistic individuals ". . . from an early age . . . should be impaired in those primary representations that are relevant for socioemotional and especially affective interpersonal relations." -- (Hobson, 1990b, p. 118). Furthermore, studies with autistic adults have shown that the difficulty of recognising emotional states remains in adult life and this does not support the hypothesis of a developmental delay (Harris, 1989).

These discussions still leave undecided whether or not affective or cognitive deficits are primary, and the debate continues in the most recent publications with suggestions of other kinds of psychological deficit. Ozonoff, Rogers and Pennington (1991) argue that autistic deficits cannot be explained only on the basis of 'theory of mind' deficits; high-functioning autistic people can succeed in 'theory of mind' tasks, but they fail in tasks of executive function. Hermelin and O'Connor (1985) suggested some time ago that failure of a 'logico-affective' system is responsible for the social impairment in autism. A similar theoretical framework is used by Marian Sigman and her collaborators to explain joint attention deficits, which they find to be an important feature of autism (Mundy and Sigman, 1989a, 1989b), as well as deficits in 'symbolic' play (Sigman and Ungerer, 1984a), abnormal prosodic elements of speech (Mundy and Sigman, 1989b) and abnormal affective states (Kasari et al, 1990; Yirmiya et al, 1992).

2. Development of Play in Normally Developing Children

At all ages, play is associated with personal development but the period of early childhood is invaluable. It is the stage in which a suitable environment for education, and for the support of both emotional and cognitive development is established. For this reason this review concentrates on the preschool years, but first we shall discuss the definition of play, two major theoretical frameworks for analysing play, and the empirical studies which have been carried out in these frameworks.

2.1. Definition and Theories of Play

Several definitions of play have been offered and there are many theories about play. However, ". . . the widely shared notion that the entity 'play' is a behavioural disposition that occurs in describable and reproduceable contexts and is manifest in a variety of observable behaviours." -- (Rubin et al, 1983, p. 698) can be accepted as a basis for research analysing play in behavioural terms. Although theories of play have been constructed in historical, evolutionary, psychoanalytic, anthropological, cognitive, animal, linguistic, communicative or philosophical frameworks (Sutton-Smith and Kelly-Byrne, 1984), here only the cognitive and communication theories of play will be briefly discussed, because they a) are related to the debate about the primacy of a cognitive or affective basis of the autistic disorder, which was discussed in the previous section, and b) provide a framework for understanding the empirical studies of play in autism that have focused on the cognitive aspects of play.

In the literature, play is found to be linked with the acquisition of language and symbolic representation (Piaget, 1962), language and thinking (Vygotsky, 1966), and cooperative understanding (Trevarthen, 1979a, 1979b). It has also been considered essential in the development of tool use and problem solving (Bruner, 1972), social interaction (Garvey, 1972, 1977), meta-communication and social construction (Bateson, 1972) and of the 'theory of mind' (Baron-Cohen, 1987; Leslie, 1987). 'Symbolic', 'imaginative', 'fantasy', 'pretend' or 'make-believe' play develops in the normal child during the second year and is considered to be associated with the development of language and generally with the emergence of representational thought (Piaget, 1962; Vygotsky, 1966), and this link between fantasy play and language also exists in the development of autistic children (McHale et al, 1980; Riguet et al, 1981; Ungerer and Sigman, 1981; Mundy et al, 1987).

For Piaget (1962) play is a symbolic system that provides the child with a means of assimilation needed in order to rethink past experience and is a reflection of egocentric thought. Play is taken to progress from 'activity' to 'representation', and as resulting in a form of symbolic

representation. It is a transition process that takes the child from the earliest form of sensorimotor intelligence to the operational structures that characterize mature thought (Athey, 1984).

Leslie (1987), a contemporary cognitive developmental theorist, proposed a 'theory of mind' hypothesis for the ability to pretend, and therefore, to exhibit pretend play. He distinguishes between two kinds of representations in the child's mind: the primary representation which accounts for the child's capacity to represent the world as it is, and the meta-representation which accounts for representing the world as something different from what it is. Meta-representation can explain internal pretence; 'I pretend the banana is a telephone', or understanding pretence in others; 'Mother pretends that the banana is a telephone'.

Vygotsky (1978), in contrast to Piaget, emphasized the social and affective role of play. Play is, for Vygotsky, the source of development and it is created in the 'zone of proximal development', which is the functional space between what the child can do on his/her own and what the child can do with assistance. Every psychological function, including play, appears ". . . first, between people (interpsychological), and then inside the child (intrapsychological)." -- (Vygotsky, 1978, p. 57). Symbolic representation is the significant result of play behaviour, which is a means of creation of roles and rules, and of formation of symbols (Vygotsky, 1966).

Bateson (1955) also emphasized the communicative function of play. A prerequisite for play is ". . . some degree of metacommunication, i.e., of exchanging signals which would carry the message 'this is play'." -- (Bateson, 1955, p. 41). The message of play is considered as a kind of paradox; the player indicates that one thing is so, but at the same time that it is not so. It is supposed to promote equilibration. The child learns the rules of meta-communication, and therefore implicitly the way in which reality is socially constructed. In this way, the child is learning to be social as well as imaginative (Sutton-Smith and Kelly-Byrne, 1984).

2.2. Categories of Play Behaviour

Theories about children's play have generated many empirical studies most of which have focused on the development of young children's symbolic play, the most advanced form of play with a significant relationship to language acquisition (Lowe, 1975; Nicolich, 1977; McCune-Nicolich, 1981; Ungerer et al, 1981), but there are a few studies which have considered a broader spectrum of play categories, including 'manipulative' or 'exploratory' and 'functional' play.

2.2.1. Exploratory Play

There has been a debate in the literature as to whether forms of exploratory behaviour constitute a distinct type of play or not. Exploration is differentiated from play on the grounds that it involves stereotypical behaviour, that attention is deployed towards a real and present object and that it is marked by neutral or mildly negative affect (Wohlwill, 1984). However, it is difficult in early development to distinguish between exploration and play because the environment is largely novel and the child is dominated by motives of curiosity and investigation. In the course of development exploration and play diverge and become easily separable (Hutt, 1966). It seems that either exploration precedes and constitutes a prerequisite of advanced play in order to form some cognitive structures, or that it appears simultaneously with play. An exploratory behaviour can lead progressively to elaborate play and is not merely characterized by stereotypy. It can also take place during affective interaction with an adult from early months (Trevarthen and Hubley, 1978) and become free of the neutral emotions and attentions of a subject whose mind is oriented only to objects. Exploratory behaviour often takes place in a social context and there are different styles of exploration, ranging from simple touching of an object to inquisitive behaviour with an object or observation of others' activities. Therefore, exploration involves both object exploration and social exploration. The view that exploration is an acceptable form of play has been expressed as follows:

> "The measurement of children's exploratory behaviour has generally followed one of three approaches. One is the laboratory

> study of perceptual exploration, usually visual exploration . . . A second tradition is the study of what might be called 'exploratory play'. The focus in this tradition has been on the child's manipulation of and questions about novel toys in more or less naturalistic conditions in homes, schools and laboratories. Finally, there are studies that assume an underlying exploratory predisposition or curiosity trait in the child as indicated by teacher or peer ratings or responses to questionnaires." -- (Henderson, 1984, p. 176).

Thus, it is concluded that exploration is a form of play --visual or manipulative or social--, which dominates learning in the first year, but which will decline to establish the basis for the emergence of or transition to 'symbolic' play in the beginning of the second year. The latter will thereafter progress into sophisticated forms, and then, decrease with the rise of games with conventional rules (Belsky and Most, 1981; Fein, 1981; Vondra and Belsky, 1989).

2.2.2. *Other Types of Play*

Fenson, Kagan, Kearsley and Zelazo (1976) in a cross-sectional study of 7-20 month old children categorized play behaviours into three classes, i.e. 'relational', 'symbolic' and 'sequential' acts. At 7 months infants' play was characterized by visual, oral and tactual examination of objects. The first level of 'relational' play appears at 9 months, when an infant relates or combines two objects. Relational acts were distinguished into appropriate associations between objects (e.g. putting the lid on the pot), into inappropriate associations (e.g. touching the lid against the side of a cup), and into grouping objects (e.g. putting two spoons together). Symbolic activities, in the second class, took place from 9 to 20 months and included eating, drinking, pouring, stirring and spooning from one container to another. The last class of play, from 13 to 20 months involved performing two identical consecutive acts (e.g. putting a cup on a saucer and immediately afterward placing another cup on another saucer), and combining two different but thematically similar acts into a sequence (e.g. stirring in a cup and then in a pot).

Fenson and Ramsay (1980) studied extensively the transition from self-centered or self-directed play acts to decentered play which is finally integrated into multiple scheme sequences, i.e., in Piagetian terms, the transition from 'sensorimotor' to 'representational' cognition. They observed that decentered acts were prominent by 19 months, single scheme combinations of centered and decentered acts were exhibited by 19 months and multiple scheme combinations emerged by 24 months.

Ungerer and Sigman (1984), in an investigation of the relation of play and sensorimotor behaviour to language in the second year, defined five play behaviours. The first behaviour, included 'simple manipulation' of objects (12 months) such as mouthing, waving, banging, fingering or throwing a single toy. The second category, 'relational' play (12 months), involved combination of objects, such as touching or banging two objects together in a non functional manner, stacking objects and using one object as a container to hold another object. The last two sub-categories excluded those behaviours which were considered functional associations of objects, e.g. placing a cup on a saucer or putting a spoon into a cup. 'Functional' play (12-18 months) included functional or conventional associations of objects. Four different sub-categories were recorded: a) self-directed acts, e.g. brushing one's hair, b) doll-directed acts, e.g. feeding a doll with a spoon, c) other-directed acts, e.g. holding a telephone receiver to the mother's ear and d) object-directed acts e.g. placing the top on the teapot. The fourth category, 'symbolic' play (18-24 months) was classified into three types: a) the use of one object as if it were a different object (substitution play), e.g. using a cup as a telephone receiver, b) use of a doll as an independent agent of action (agent play), e.g. propping a bottle in a doll's arms as if it could feed itself and c) creation of objects or people having no physical representation in the immediate environment (imaginary play), e.g. making pouring sounds as imaginary tea is poured from a teapot into a cup. 'Sequences' (18-24 months) was the last category and it was recorded to measure meaningful integrated sequences of functional and symbolic acts in play. Vondra and Belsky (1989) used the additional category of 'transitional' play, which is characteristic of 8-9 month old children and signifies the transition from 'functional' to 'symbolic' play.

Taking in mind these theories of play in normally developing children, parallel issues in studies with autistic children are explored below to see where the development of these children is delayed or deviant. It will be noted that all the above studies focused on the playful behaviours of individual children thinking and acting alone and communication was not considered at all.

3. Development of Play in Children with Autism

Deviant kinds of play behaviours are best understood in relation to the normal course of development, which reveals how the motives for play involve the child in increasingly complex levels of thinking and imagining as well as communicating and cooperating.

3.1. Different Classification Systems - Evidence from Empirical Studies

Autistic children's play is described as being dominated by fascination with the presence of objects rather than their possible meaning (Eisenberg and Kanner, 1956) and by many repetitive activities (Kanner, 1943; Eisenberg and Kanner, 1956; Tilton and Ottinger, 1964[1]; DeMyer et al, 1967; Black et al, 1975; Rutter, 1978; DSM-III-R, 1987). Furthermore, it is widely believed that autistic children's 'symbolic' play is poor or absent (Kanner, 1943; Wing et al, 1977; Rutter, 1978; Ungerer and Sigman, 1981; Doherty and Rosenfeld, 1984; Wetherby and Prutting, 1984; Wulff, 1985; Baron-Cohen, 1987; DSM-III-R, 1987).

A wide range of terms are used to describe kinds of play in studies of autistic children, as with normally developing children. This multiplicity of classifications does not facilitate comparative study of the play of autistic children at any particular developmental level. Some commonly used categories are overlapping (e.g. 'simple manipulation' and 'sensorimotor' play), others are employed with different meanings (e.g. 'symbolic' and 'pretend' play) and still others are absent from some studies. It seems that this variation is due to the differing aims and theoretical backgrounds of the projects. Earlier studies looked more for

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[1] A second analysis of the results (Weiner, Ottinger and Tilton, 1969) showed that there were no significant differences in repetitive use of objects between the groups.

deficits of play in autistic children, e.g. their repetitive activities, but the latest studies are more influenced by the descriptions of play in normal development. An increasing focus on 'symbolic' play has created a tendency for re-definition of 'symbolic' or 'pretend' or 'imaginative' or 'representational' or 'make-believe' or 'fantasy' play in studies with the autistic population.

Tilton and Ottinger (1964) defined nine categories of toy use, principally concerned with manipulation and combination of objects: combinatorial uses, separation of parts, manipulations of movable parts, personalized uses, pushing or pulling, throwing, pounding, oral contacts and repetitive manual manipulations. Wing, Gould, Yeates and Brierly (1977) classified play into three classes; 'non-symbolic' play includes repetitive manipulation of objects; 'stereotyped' play is symbolic play that is characterized by stereotypies, repetitive acts and lack of innovation; 'symbolic' play or other relevant activity includes symbolic activities, e.g. making car noises, pretending to drive into a garage, but functional activities as well, e.g. brushing a doll's hair. Riguet, Taylor, Benaroya and Klein (1981) used a 5-point scale to record children's play: 'motor', 'transitional' 'symbolic', 'animation' or 'non animated symbolic sequence' and 'animated sequence'. Doherty and Rosenfeld (1984) distinguished three main types of play, combining 'relational' and 'functional' play in one category. The first type is 'sensorimotor' or 'practice' play which involves sensory awareness, body movements and physical manipulation of objects in the environment. The second category, 'functional' or 'relational' play involves appropriate use of objects and meaningful relation of many objects together. 'Symbolic' or 'conceptual' play is the last type and involves make-believe play and animation of objects. Wetherby and Prutting (1984) used only two play behaviours, integrating 'sensorimotor' play into 'combinatorial', and 'functional' play into 'symbolic'.

Ungerer and Sigman (1981) and Sigman and Ungerer (1984a) used the most extensive coding system for recording play based on play behaviours they observed in normal development (Ungerer and Sigman, 1984). Their coding scheme included four categories: 'simple manipulation' of objects, 'relational', 'functional' and 'symbolic' play.

The category 'sequences', which was defined as a different type of play in the article by Ungerer and Sigman (1984), was included as a sub-category of both 'functional' and 'symbolic' play. More limited studies were conducted by Mundy, Sigman, Ungerer and Sherman (1986, 1987) who examined only 'functional' and 'symbolic' play, using the definitions of their previous studies.

Baron-Cohen (1987), influenced by Leslie's (1987) theory of 'pretence', introduced the notion of 'pretend' play as a substitute for 'symbolic' play. He defined 'sensorimotor' play as the use of objects with no attention paid to their function (e.g. throwing an animal), and 'ordering' play as the use of objects by imposing some pattern on them (e.g. piling animals up). More advanced forms of play are: 'functional' play in which the child uses objects according to their function (e.g. naming the animals), and 'pretend' play in which the child uses an object as if it were another object, or attributes properties to an object which it does not have, or refers to absent objects as if they were present (e.g. animating animals).

Lewis and Boucher (1988) defined 'manipulative', 'functional' and 'symbolic' play similarly to the definitions of 'sensorimotor', 'functional' and 'pretend' play found in the article by Baron-Cohen (1987). In addition, Lewis and Boucher used the term 'pretend' play to refer to imaginative play including 'functional' and 'symbolic'. They introduced the use of unconventional toys and they included two new categories: 'no play' to indicate absence of play, and 'intermediate' play to record instances of play falling between the categories of 'functional' and 'symbolic' play.

Stone, Lemanek, Fishel, Fernandez and Altemeier (1990) recorded the categories of 'manipulative', 'relational', 'functional' and 'symbolic' play borrowing the definitions of these play categories from the articles by Ungerer and Sigman (1981) and by Sigman and Ungerer (1984a).

The following table (Table 2.1) summarizes the categories of play used in various studies of autistic children conducted up to now.

Table 2.1: Summary of Play Categories used in the Existing Empirical Studies with Autistic Children

'no play'	Lewis and Boucher (1988)
'sensorimotor' play or 'manipulation' of objects	Tilton and Ottinger (1964); Wing et al (1977); Riguet et al (1981); Ungerer and Sigman (1981); Doherty and Rosenfeld (1984); Sigman and Ungerer (1984a); Baron-Cohen (1987); Lewis and Boucher (1988); Stone et al (1990)
'combinatorial' including 'sensorimotor' play	Wetherby and Prutting (1984)
'combinatorial' or 'relational' play	Tilton and Ottinger (1964); Ungerer and Sigman (1981); Sigman and Ungerer (1984a); Baron-Cohen (1987); Stone et al (1990)
'functional' including 'relational' play	Doherty and Rosenfeld (1984)
'functional' play	Ungerer and Sigman (1981); Sigman and Ungerer (1984a); Mundy et al (1986); Baron-Cohen (1987); Mundy et al (1987); Lewis and Boucher (1988); Stone et al (1990)
'symbolic' including 'functional' play	Wetherby and Prutting (1984)
'intermediate' play	Lewis and Boucher (1988)
'symbolic' or 'pretend' play	Wing et al (1977); Riguet et al (1981); Ungerer and Sigman (1981); Doherty and Rosenfeld (1984); Sigman and Ungerer (1984a); Mundy et al (1986); Baron-Cohen (1987); Mundy et al (1987); Lewis and Boucher (1988); Stone et al (1990)

Detailed reports of studies on autistic children's 'symbolic' play are given in a review published in 1985 (Wulff, 1985) and in another published very recently (Jarrold et al, 1993). In this thesis an attempt is made to review the literature on all aspects of autistic children's play.

Experimental or comparative studies have investigated autistic children's play using categories from the classification systems described above. Their 'sensorimotor' or 'manipulative' play has been found to be unimpaired in several studies (Ungerer and Sigman, 1981; Doherty and

Rosenfeld, 1984; Sigman and Ungerer, 1984a; Wetherby and Prutting, 1984; Baron-Cohen, 1987; Lewis and Boucher, 1988; Stone et al, 1990). However, it has been reported that autistic children in a situation that elicits exploratory behaviour with toys prefer to show stereotypical behaviours (Hutt et al, 1964).

Only one study has found paucity of combinatorial use of objects (Tilton and Ottinger, 1964) when autistic children were compared with developmentally-delayed and non-delayed children matched on chronological age. However, many other studies employing more rigorous matching procedures have not found that autistic children's 'combinatorial' or 'relational' play is impaired in comparison with controls (Riguet et al, 1981; Ungerer and Sigman, 1981; Doherty and Rosenfeld, 1984; Sigman and Ungerer, 1984a; Wetherby and Prutting, 1984; Baron-Cohen, 1987; Stone et al, 1990).

The 'functional' play of autistic children has also been found to be unimpaired in both observational studies (Ungerer and Sigman, 1981; Doherty and Rosenfeld, 1984; Baron-Cohen, 1987) and those employing elicited situations (Lewis and Boucher, 1988). However, some studies report that the amount of 'functional' play of autistic children is lower than in control groups during spontaneous or free play sessions (Sigman and Ungerer, 1984a; Lewis and Boucher, 1988; Stone et al, 1990).

The findings on 'symbolic' play are contradictory. Some studies claim that 'symbolic' play is impaired in autism in free or spontaneous situations (Sigman and Ungerer, 1984a; Baron-Cohen, 1987; Lewis and Boucher, 1988) and others that it is unimpaired in such situations (Stone et al, 1990). Furthermore, some studies report that autistic children lack 'symbolic' play in structured or elicited or modelled situations (Riguet et al, 1981; Sigman and Ungerer, 1984a; Mundy et al, 1986) and others that they do not (Lewis and Boucher, 1988).

3.2. Criticism of Empirical Studies

It is doubtful if the above studies offer sufficiently unambiguous qualitative data to give an adequate account of the development of play in autistic children. The information on play was derived either from

clinical impressions (Kanner, 1943; Wing et al, 1977), or from observations of the play of children diagnosed variably as 'childhood schizophrenic', 'autistic type' or 'autistic with symbiotic features' (Tilton and Ottinger, 1964; DeMyer et al, 1967). Other data came from maternal questionnaires (DeMyer et al, 1967) and parental interviews (Wing et al, 1977; Doherty and Rosenfeld, 1984).

It is interesting that although the study of 'symbolic' play in autism has stimulated the interest of a considerable scientific literature, there remain specific critical deficiencies in studies of play in general. These problems concern, as explained, the confusion of terms for the definition of play and the multiple interpretation of the contradictory findings. Furthermore, the problems expand in regard to methodological issues of group composition, chronological age of the children, matching procedures and procedure or setting of data collection.

Diagnosis of the Autistic Group

In the recent studies of play, children are most commonly diagnosed as autistic if they meet Rutter's criteria (Baron-Cohen, 1987; Lewis and Boucher, 1988) or DSM-III criteria (Ungerer and Sigman, 1981; Doherty and Rosenfeld, 1984; Sigman and Ungerer, 1984a; Mundy et al, 1986; Mundy et al, 1987; Stone et al, 1990). Findings might differ because children will have a different profile of autism.

Chronological Age

Regarding the issue of chronological age, in two studies the autistic children examined were either too old for this kind of play to be expected on normal developmental criteria and they were compared with very young normally developing children (Baron-Cohen, 1987; Riguet et al, 1981), or very young autistic children were observed in the absence of a control group (Ungerer and Sigman, 1981; Mundy et al, 1987).

Varied Matching Procedures

Procedures for matching autistic children with developmentally-delayed and/or normally developing children in the various studies have not been uniform and adequate for obtaining clear conclusions.

Children have either not been matched at all, or have been matched on chronological age or on tests measuring general intelligence or verbal or non-verbal mental age.

It is important to match the autistic children with their comparison groups according to their abilities in order to control for the effects of mental retardation. Thus, the behaviours observed in the autistic children can be attributed to their diagnosis of autism and not to their mental retardation. However, some studies examining autistic children's play included comparison groups of children with developmental disorders which were not matched at all (Wing et al, 1977; Doherty and Rosenfeld, 1984; Atlas, 1990) and still others were matched only on chronological age (Tilton and Ottinger, 1964; DeMyer et al, 1967; Stone et al, 1990). In other studies, participant groups were equated on tests measuring general intelligence (Sigman and Ungerer, 1984a; Mundy et al, 1986) or 'symbolic' play ability (Power and Radcliffe, 1989), overlooking the fact that the level of language functioning influences performance on tests of general intelligence and plays a crucial role for the production of play (see below). The importance of language has been considered in some studies which matched autistic children with other groups of children on tests measuring verbal abilities.

Riguet and his colleagues (1981) studied the free and structured play of autistic children including comparison groups of children with Down's syndrome and normally developing children matched on verbal mental age as measured by performance on the Peabody Picture Vocabulary Test (PPVT). Baron-Cohen (1987) claims that he matched his groups on non-verbal mental age and verbal age as well, but the normally developing children were much more able verbally than the autistic and the Down's syndrome children (verbal mental age of autistic children=2 years and 5 months, of children with Down's syndrome= 2 years and 5 months, and of normally developing children=4 years and 1 month). The use of a comparison group comprising only Down's syndrome children to control for the effects of general mental retardation, is widely criticized by researchers on the grounds that these children form a specific and unique group (Wishart, 1991; personal communication). Baron-Cohen (1987) also studied play with a mixed

group of verbal and non-verbal autistic children (N=10 autistic and N=10 Down's syndrome from whom 3 of each group were non-verbal). According to the author the emphasis of this study was on the diagnostic group, and not on the level of language. However, the study of Ungerer and Sigman (1981) has shown that significant play differences appear depending on whether or not language abilities are high or low. Lewis and Boucher (1988) have criticized Baron-Cohen's study by arguing that the British Picture Vocabulary Scale (BPVS) disadvantages the autistic group. The BPVS gives weight to the production of single items of vocabulary, but it is known that autistic children differ in more complex language skills (Ungerer and Sigman, 1981) and that both receptive and expressive language skills are correlated with 'symbolic' play (Mundy et al, 1987). The importance of matching the comparison groups properly on verbal mental age in the design of an experiment is expressed as follows by Weeks and Hobson (1987):

> "The language-related disability of autistic children is amongst the most profound of their cognitive impairments . . . By matching subjects according to a measure of verbal ability, therefore, it was assured that in most other areas of cognitive function, the autistic children would be at least as proficient as the non-autistic control subjects." -- (Weeks and Hobson, 1987, p. 141).

Variations in Settings

The studies of play with autistic children have not applied a common or standard situation. One of three settings have been used in most studies: 'spontaneous, free or unstructured', 'structured' or 'elicited'.

Wing and Gould (1978), in addition to collecting parents' or teachers' interviews about the children's play, observed the children at school or at home. Three studies observed the spontaneous play of autistic children (Baron-Cohen, 1987; Mundy et al, 1987; Stone et al, 1990), but only one study included relatively appropriate comparison groups (Baron-Cohen, 1987).

In the study by Riguet, Taylor, Benaroya and Klein (1981) a sequence of five experimental conditions was used: a free play session, a

structured situation, a session involving modelling, a second structured session including different toys and a final free play period. Lewis and Boucher (1988) observed the solitary spontaneous play of the child followed by elicited and instructed play. In the elicited situation the experimenter said, for example, to the child 'Show me what you can do with these' and in the instructed session 'Make the car go to the garage'. However, the study of Lewis and Boucher (1988) has been criticized by Baron-Cohen as having ". . . designs such that sensible guessing will lead to behaviour strongly resembling preten e." -- (Baron-Cohen, 1990, p. 207).

Other studies have combined unstructured and structured situations (Ungerer and Sigman, 1981; Sigman and Ungerer, 1984a; Wetherby and Prutting, 1984; Mundy et al, 1986). The purpose of the unstructured session in these studies was to observe the spontaneous play of the autistic children. However, the experimenter modelled four different symbolic acts and following modelling the child was permitted to play alone. When the unstructured session ended a structured setting was used to observe the children's use of objects in one-to-one interaction with the experimenter. In cases where the child did not use the objects functionally, the experimenter directed the child in the functional use by verbal cueing and if there was no response he modelled acts.

The variations observed in the settings used for the study of play with autistic children complicates the understanding of play in this group because different settings tend to indicate different results. However, this is inevitable because researchers try to fulfil different aims.

3.3. Explanations of Deficits in Symbolic Play

Researchers have attempted to explain the deficit in 'symbolic' play of children on the basis of various theoretical hypotheses. Their interest in 'symbolic' play stems from its importance for the acquisition of language (Piaget, 1962; Vygotsky, 1966; Bruner, 1972), for the development of representations (Leslie, 1987) and for cultural understanding (Mead, 1934; Bateson, 1972; Trevarthen, 1979a, 1979b). This varied interest directs alternative concepts of the 'symbol', which is

defined in terms of the mental processes in one individual, or of the communication and cooperation involved within a dyad. Thus,

> a) a symbol is ". . . something that stands for, represents, or denotes something else, not by exact resemblance, but by vague suggestion or by some accidental or conventional relation." -- (Ricks and Wing, 1975, p. 192), or
>
> b) a symbol is ". . . a representation of a representation, or is a 'second-order' representation." -- (Baron-Cohen, 1987, p. 146), or
>
> c) symbols are ". . . experiences and actions with interest and usefulness given to them by the motives for cooperative awareness." -- (Trevarthen and Logotheti, 1987, p. 61).

Similarly to the second definition of symbol by Baron-Cohen (1987), Harris (1989) refers to two types of pretence: 'simple pretence' requires use of physical objects or their properties and emerges by 18 months; 'advanced pretence' like 'second-order representations' requires attribution of mental states and appears at around 24 months. 'Simple pretence' and 'advanced pretence' can appear together in play.

Ricks and Wing (1975) were the first to claim that autistic children are impaired in the formation and manipulation of symbols and to propose a symbol deficit theory. Baron-Cohen (1987) defined the second-order representations, which autistic children lack, as symbols, and concluded that this is evidence that the autistic children do not have the capacity to produce symbols.

In opposition to the cognitive symbol deficit theory, it is suggested by others that the deficit in symbol use stems from the primary deficit of the autistic child to engage in social relations (Fein et al, 1986), or to form social-affective relations (Hobson, 1989a, 1989b, 1990b, 1991b), or to participate in social interaction (Klin, 1989). Sigman and Ungerer (1984a) offered two hypotheses to explain the deficits in autism. The first hypothesis claims that there are two systems: the first is reflected in the development of 'sensorimotor' skills and involves the capacity to recall information, and the second one is reflected in the capacity to transfer experiences into language and symbols for play. It seems that the second system contributes to the deficits of the autistic children. The second

hypothesis claims that the cognitive deficits of these children are secondary to their impaired social development. However, these two hypotheses are not independent and most possibly a socio-cognitive model should be adopted. Rogers and Pennington (1991) propose a socio-affective theory as an explanation of the deficits in symbolisation, claiming that impairments in imitation and 'theory of mind' cause 'pretend' play deficits.

Other hypotheses assuming the primacy of a social deficit are those of Lewis and Boucher, and Harris. Lewis and Boucher (1988) suggested that the impaired spontaneous 'symbolic' play of autistic children can be explained as some form of conative (motivational) abnormality, possibly associated with the lack of pleasure that these children experience during 'pretend' play. Similarly, Harris claims that the impairment in 'symbolic' play is attributable to motivational deficits as a consequence of autistic children's indifference to social contact (Harris, 1989, 1993).

> "The developments in pretend play . . . refer to the child's emerging ability to impute agency and intention. It is conceivable that autistic children rarely produce pretend play, not because they completely lack the ability to do so, but because the type of object-directed play that they prefer can be readily carried out without much call for pretence." -- (Harris, 1989, p. 207).

So far, it seems that the play of autistic children has attracted the interest of most researchers to an interpretation based on a theory of developing cognitive functions, following Piaget (1962) or Leslie (1987). The social, interactive components in normally developing children's play, stressed by Vygotsky (1978), Bateson (1955), and Trevarthen and his collaborators (Hubley and Trevarthen, 1979; Trevarthen and Marwick, 1982) have been given less attention. Furthermore, the findings indicate a confusion of ideas about the nature of the impairment in 'symbolic' play. Clearly further studies are needed.

4. The Normal Development of Communication

Research on infancy has shown that interaction of infants with their mothers is characterized by synchrony (Condon, 1979; Austin and Peery, 1983), reciprocity (Brazelton et al, 1974) and mutuality (Tronick et al, 1979). Neonates (Meltzoff, 1985; Kugiumutzakis, 1993) and infants (Pawlby, 1976) can imitate expressions of face, voice or hands in a communicative way. Mothers adjust their speech and intonation to the infant's level --'motherese'-- so that they can share the same expressions (Stern et al, 1982; Papousek et al, 1985). Mother and infant are both able to engage in intersubjective communication following each other's activity (Trevarthen, 1977; Tronick et al, 1980), in a dialogue of shared meanings (Newson, 1979), and in 'affect attunement' sharing each other's inner feeling states (Stern et al, 1985). Infants by showing behaviours of smiling, eyebrow movements, vocalizations, eye-contact, pre-speech and gesticulation appear to be aware of sharing their own attention with others (Trevarthen, 1977). Mothers also appear to adjust their response to infants' acts (Trevarthen, 1979a). In a peekaboo play sequence mother and child anticipate each other's initiatives and they are able to modify and conventionalize this sequence (Bruner and Sherwood, 1975). Mothers and infants are capable of giving and taking signals for entering into a turn-taking sequence of interaction similar to conversation of adults (Trevarthen, 1974; Mayer and Tronick, 1985). They also match the timing of their interactions with vocal and kinesic behaviours (Beebe et al, 1985).

There is a transition from person-to-person interaction --'primary intersubjectivity'-- to person-object-person interaction --'secondary intersubjectivity'-- near the end of the first year. Infants of 3-8 months old show exploratory behaviour with objects and later, when they are around their first birthday, act cooperatively with their mothers in a joint task (Trevarthen, 1979b). The acquisition of this milestone will lead to joint attention between mothers and 2-year old children; their interaction is either symmetrical and both interactants play equal roles, or reciprocal in which, for a time, one interactant plays a more active role than the other (Rocissano and Yatchmink, 1984).

Infants of 6 to 18 months of age primarily engage with persons, and as they grow older they show coordinated joint engagement between people and objects (Bakeman and Adamson, 1984), or 'joint action' with other individuals (Bruner, 1975). At the same time they are able to show affective states with a familiar interactional partner like their mother during face-to-face or person-object-person interaction (Adamson and Bakeman, 1985). They are also able to exhibit visual co-ordination to the same object as their mother, which is assisted by the mother's tendency to follow the infant's attention (Collis and Schaffer, 1975). 12-, 18- and 24-month-old children can share objects with others by showing, giving and engaging in mutual play (Rheingold et al, 1976; Hay, 1979). Pointing as a behaviour to maintain the other's attention emerges at 9 months (Murphy, 1978) and by 12 months is integrated with vocalizations and eye contact with the partner (Leung and Rheingold, 1981).

In the first year, an infant does not speak or understand language but is able to discriminate his mother's voice and will try to obtain the sound of her voice in preference to the voice of a female stranger (DeCasper and Fifer, 1980). Infants only 49 days after birth can participate in 'proto-conversations', which are brief joint exchanges of sounds with the mother similar to adult conversation (Bateson, 1979). By 4 months, long before the onset of speech, infants engage in eye-to-eye contact with their mothers; these 'gaze couplings' are accompanied by vocalizations as precursors of 'conversational couplings' (Jaffe et al, 1973). From birth to five months infants produce different sounds, at 6 months they start babbling, and a month later, will make the same repetitive sounds, a process called echolalia. At around 9 months, babbling is more complex including various intonational patterns, which is called the 'jargon' period (Smith and Cowie, 1988; Bee, 1992). By 12 months the child will start to say the first words, which can be similar to, or learned from, the single-word utterances of their mothers (Ninio, 1992). At around 18 months, a child will combine single words into two-word sentences. From 2 to 3 years children use sentences of three and four words, their sentences become increasingly grammatical and they start singing rhymes and songs. By 3 years children use complex sentences (Smith and Cowie, 1988; Bee, 1992). Children between $3\frac{1}{2}$ and 5 years produce social

speech, i.e. their utterances are mutually responsive and well-adapted to the verbal or non-verbal behaviour of their partner (Garvey and Hogan, 1973). Preschool children start to understand and use correctly the relational opposites of quantity, space, width and size. In the same period, children are aware of using language in order to communicate effectively. They adjust their speech to their listener's level of understanding, know that it is more effective to use polite requests rather than imperatives and are able to repair others' and their own ambiguous messages (Shaffer, 1989).

All four levels of language development, -- the phonological (i.e. the sound system and the combination of sounds to produce words and sentences), the syntactic (i.e. the form or structure of language), the semantic (i.e. the expressed meaning of words and sentences) and the pragmatic (i.e. the appropriate use of language in social contexts) --, are developing during the preschool period and by 5 years old, children have mastered many aspects of all these levels in language development (Shaffer, 1989).

5. Development of Communication in Children with Autism

It has been shown in the above section that children developing normally engage in interactions with their mothers and other adults during infancy, and as they grow older, become increasingly competent in the comprehension and expression of language. These developmental milestones appear deviant in autistic children, and evidence for such a claim can be found mainly in retrospective studies of infants later diagnosed as autistic, in empirical studies of autistic children' s verbal and non-verbal communication, and in the analysis of interactions between autistic children and their mothers.

5.1. Evidence of Autistic Behaviour in Infancy

There is anecdotal evidence about the behaviour of autistic children in early infancy stemming from retrospective parental reports and video data. It seems that the pattern normally observed in the prelinguistic stage of development is distorted in autism. Some mothers report that there was something abnormal with their child since he/she

was born, and others that they recognized a problem developing slowly as the child progressed through the first three years. Approximately one third of the children show normal behaviour early in life and a regression appears just before the age of 3 years. For example, Eriksson and DeChateau (1992) analysed videotapes of an autistic girl filmed from birth and observed that although she was developing normally during the first year, later she became withdrawn without any apparent medical or biological reason. Some autistic infants cry rarely without demanding any attention. However, others cry very often, they even scream, and they have feeding and sleeping problems. There is a lack of interest in social contact and in the human voice. They smile, but not in response to social approaches. In the final part of their first year they do not show exploratory behaviour of their environment and they do not engage in shared activities with their parents. They are self-content to manipulate a specific object over a period of time and they can be fascinated with certain sensory experiences (Wing, 1976).

There are several studies that report features of the autistic syndrome very early in infancy and the effects of the children's behaviour on their mothers. Sparling (1991) in the analysis of a prospective case study reported that abnormalities in expressive and receptive communication, and in eye contact during interaction with the mother could be observed at 3 months, even though the mother's interactive style was characterized as of high 'quality' and 'appropriateness'. Ricks (1979) investigated the way in which pre-verbal autistic children, between their third and sixth birthday, and normally developing infants in their first 2 years of life, conveyed emotional meaning in four different types of sounds, to express: request, frustration, greeting and pleasant surprise. He found that parents of autistic children were able to recognize their own child and normally developing children from their sounds, but they were not able to identify the sounds of other autistic children. Thus, the signals given by pre-verbal autistic children were very idiosyncratic and were not characterized by the universal features observed in the normal infants. Kubicek (1980) described the organization of two mother-infant interactions involving a normal infant and his fraternal twin brother

who was later diagnosed as autistic (Twin A). These recordings were made when the infants were between 3 and 16 weeks. She reported that:

> the ". . . system of mutual exchange, based on subtle differences in facial expression and body movement, never occurred in the interaction between the mother and Twin A. Twin A failed to provide his mother with positive feedback, which is considered essential for establishing a 'normal' mother-infant interaction . . . Furthermore, he did not respond differentially to subtle changes in maternal behaviours, making it difficult for her to respond appropriately . . . " -- (Kubicek, 1980, p. 109).

Other studies give information about the development of a possible autistic disorder later in infancy. Adrien, Faure, Perrot, Hameury, Garreau, Barthelemy, and Sauvage (1991) analysed home movies of children later diagnosed as autistic. They observed that in the first 2 years problems with social interaction, emotional disorders, abnormal visual and auditory behaviours, atypical behaviour and disorders of tone and motor behaviour appeared. Furthermore, in another study of 10 cases in the same age range, it was revealed that certain behaviours were identified and differentiated autistic from normally developing children. These behaviours involved poor social interaction, poor communication (no social smile, lack of appropriate facial expressions and gestures), adaptation to environmental situations (hypoactivity), motility (calmness and hypotonia), emotional reactions (no expression of emotions) and attention abnormality (poor concentration) (Adrien, Perrot, Hameury, Martineau, Roux and Sauvage, 1991).

On the other hand, mothers of psychotic infants (now called 'autistic') have been found to be relatively insensitive to their children's eye contact and smile in the period from birth to 6 months (Massie, 1978a). In analysis of interactions in the first 6 months of life between mothers and their psychotic babies, mothers and babies showed lower frequencies for holding, and mothers showed lower ratings for touching and eye gaze compared with normal mother-infant interaction (Massie, 1978b).

It is difficult to know if autism is manifested at birth, although autism was first described as an innate disorder present from the beginning of life (Kanner, 1943) and the literature offers some evidence for this claim. Neuropsychology has shown that changes in the growth of the brain affect developmental processes and one can propose that "The increasing evidence that growth and differentiation of the cerebral cortex may be directed by reticular and limbic influences . . . " supports ". . . the theory that autism is a disorder in the regulation of brain growth that has its effect at a particular stage of development, beginning about the end of the first year of infancy." -- (Aitken et al, 1993).

5.2. Development of Verbal and Non-Verbal Communication

So far, it has been argued that the interaction which takes place between autistic 'infants' and their mothers does not follow the pathway of the reciprocal, timed and synchronized communication which was described earlier as typical of the normally developing child. Furthermore, as the infant grows older and the acquisition of skills for verbal and non-verbal communication becomes essential, clear impairments emerge in the autistic population. All diagnostic descriptions have included the impairment in communication --both verbal and non-verbal, receptive and expressive--, as fundamental, although Kanner (1943) made the more general claim that the primary deficit in autism is social.

5.2.1. Verbal Communication

The importance of verbal communication in autistic pathogenesis is not very clear. Some authors consider the language deficits to be primary (Rutter et al, 1971), whereas others view them as by-products of other critical facets of the disorder (Boucher, 1979). Autistic children do have problems with comprehension of language. The severity of their problems is influenced by the content of language and the context in which a concept is expressed (Garfin and Lord, 1986). Their expressive language has been described as being both deviant and delayed (Cunningham, 1968). Deviant language is characterized by peculiarities, such as immediate and delayed communicative or non-communicative

echoing of speech (Wolff and Chess, 1965), pronominal reversals ('I' or 'me' vs. 'you') (Kanner, 1943; Rutter, 1978), stereotypic utterances (Rutter, 1978; DSM-III-R, 1987), inappropriate metaphors (Kanner, 1946), and abnormal prosodic patterns (Kanner, 1946; Tager-Flusberg, 1989). However, autistic children do not so often have severe problems in the phonological and syntactic development of the language. It is the semantic and functional use of language in a pragmatic or social context that constitutes the basic deficit (Tager-Flusberg, 1981). Delayed language production is manifested in the use of speech spontaneously and functionally in conversation (Cantwell et al, 1978; Rutter, 1978) and in using language for purposes of communication (Cunningham, 1966, 1968). In particular, autistic individuals have difficulties in giving or requesting or sharing information (Wolff and Chess, 1965; Cunningham, 1968; Shapiro et al, 1972; Hurtig et al, 1982), in conversational turn-taking (Prizant and Schuler, 1987), and in speaker-hearer relationships (Baltaxe, 1977).

The above studies have emphasised structural aspects of language and how language is used as communication. It is also necessary to examine the non-verbal means used for communication.

5.2.2. Non-Verbal Communication

Deficits in non-verbal communication are also reported (Kanner, 1943; Ricks and Wing, 1975). Autistic children have difficulties in comprehension and expression of non-verbal messages. Although they are able to recognize faces, they show peculiarities. Langdell (1978) showed that autistic individuals can recognize faces of familiar people by attending to the lower facial features and not to their eyes. It has been found that they are impaired in recognizing faces of unfamiliar people (Boucher and Lewis, 1992) and in interpreting odd facial expressions (Tantam et al, 1989). Autistic children have problems in recognizing (Hobson et al, 1988a, 1988b) and interpreting emotions by connecting affective states with corresponding gestures, vocalizations and contexts (Hobson, 1986a, 1986b, 1987). It is not yet very clear if autistic individuals have problems in emotion perception. The results vary depending on whether or not the autistic children were matched with their comparison groups on non-verbal or verbal mental age (Braverman et al, 1989;

Ozonoff et al, 1990; Ozonoff, Pennington and Rogers, 1991; Boucher and Lewis, 1992). However, non-delayed autistic people have difficulties in identifying others' affective states accurately (Ozonoff et al, 1990; Yirmiya et al, 1992) and in understanding complex emotions like pride and embarrassment (Capps et al, 1992).

Emotions have also been examined in a cognitive context. Baron-Cohen (1991b) showed that autistic children can understand desire and simple emotions, but they are impaired in their understanding of beliefs as a cause of emotions, such as happiness and sadness. However, Tager-Flusberg (1992) in an analysis of naturalistic observations found that autistic children are able to talk about and justify the causes of emotions.

Apart from the problems observed in the perception of emotions, autistic children are impaired in the expression of their emotions (Snow et al, 1987; Hertzig et al, 1989; Yirmiya et al, 1989), particularly in expressing positive affect in social contexts requiring joint attention (Snow et al, 1987; Kasari et al, 1990), in attending to negative emotional states of others (Sigman et al, 1992) and in expressing sympathetic comments to others' sad experiences (Loveland and Tunali, 1991). A thorough review of studies about perception and understanding of emotions in autism is published by Hobson (1991a).

Autistic children have problems with gestures, such as imitation (Curcio, 1978; Ohta, 1987) and expression of gestures (Attwood et al, 1988), including pointing (Mundy et al, 1986; Baron-Cohen, 1989a; Buitelaar et al, 1991). They are able to use and understand proto-imperative pointing or requesting gestures, but they lack production and comprehension of proto-declarative pointing or indicative gestures (Mundy et al, 1986; Baron-Cohen, 1989a; Kasari et al, 1993). Furthermore, they are unable to perform structural integration of gaze and indicating gestures while they are reacting to tasks (Buitelaar et al, 1991).

Moreover, autistic children have often been described as showing abnormalities in eye-to-eye contact. Kanner (1943) wrote that autistic children 'never looked into anyone's face'. Gaze aversion is not included in early descriptions of infants who later were diagnosed as autistic

(Wing, 1976). It seems to develop later in infancy when the child is expected to participate in reciprocal interactions (Richer, 1978). The only evidence that abnormalities in eye contact are present as early as 3 months is found in a recent prospective case report (Sparling, 1991).

From an ethological point of view, the autistic children's problems in eye-contact have been seen as evidence of avoidance behaviour. Hutt and Ounsted (1966) in observations of autistic children concluded that aversion from the face was the only social behaviour which distinguished autistic from normally developing children and indicated the tendency to avoid social interaction. The gaze aversion occurred more often to human than to non-human stimuli, and mainly as a response to an encounter with a smiling face (Hutt and Ounsted, 1966). Furthermore, the avoidance of social interactions is enhanced by others' warm approaches such as praise and responses to children's behaviours (Richer and Richards, 1975; Richer, 1976). Richer and Coss (1976) found that autistic children looked at an adult for less time and in shorter bouts than normally developing children, when they were looked at by an adult, and this behaviour of gaze aversion was accompanied by 'flight' behaviour (e.g. child moves away or turns away or looks away, closes his eyes, covers his ears etc) and stereotypies. They also found that the gaze aversion diminishes when the social interaction diminishes (when the adult had his eyes covered).

However, the results are conflicting because O'Connor and Hermelin (1967) found that autistic children did not look less at an adult who was looking at them than at someone who had his eyes closed, but Mirenda, Donnellan and Yoder (1983) reported that autistic children look at their partner during monologues but not during dialogue interactions. Moreover, Churchill and Bryson (1972) found that autistic children looked more at an adult who looked and smiled at them than at someone who sat side-by-side with them while he was paying attention to a crossword puzzle, disconfirming the gaze avoidance hypothesis. Van Engeland, Bodnar and Bolhuis (1985) pointed out that autistic children engaged less in eye-to-eye contact with the experimenter but looked at him more often than matched normally developing children.

Other researchers have indicated that observed impairment in eye contact depends on the context of the social interaction, e.g. whether or not the situation is structured or the acts of the child are imitated (Clark and Rutter, 1981; Mirenda et al, 1983; Tiegerman and Primavera, 1984), on the familiarity with the interactant (Volkmar and Mayes, 1990), and on the functional role of the eye contact (Phillips et al, 1992). It seems from the above studies that a crucial factor is not the quantity of eye contact shown by the autistic children but the quality of this behaviour and that the findings on this factor are conflicting.

5.2.3. The Nature of Communication and Autistic Children's Deficits

In order to understand why autistic children have deficits in social relationships and communication, it is necessary to clarify what constitutes 'communication', and to observe the interpersonal and realistic or practical 'context' in which communication takes place. Communicative behaviours considered deviant or delayed in autism can be seen positively depending on the theoretical framework in which they are examined.

There are many ways to begin an appropriate analysis of how children cooperate socially. McHale (1983) defined communication in terms of mere physical proximity or aggregation; children were considered to be part of a group if they were within 5 feet of one another. In the terms of Speech Act Theory (Austin, 1962), which classifies the communicative intentions of language users, autistic children can often be viewed as interactive, since they do use verbal and non-verbal communication spontaneously and intentionally to reach their goals with other persons' aid (Wetherby and Prutting, 1984; Wetherby, 1986). In the framework of the theory of pragmatics in language, defining the effects of utterances or gestures between people, what they do to each other with language, the abnormal language of autistic children can still have a communicative function. For example, a single apparently meaningless repeated utterance of a 4-year-old boy was found to be used effectively as a tool to engage his conversational partner in interaction (Coggins and Frederickson, 1988). On the other hand, when communication is studied in terms of 'joint attention' or 'shared focus'

(Mundy et al, 1986; Sigman et al, 1986) autistic children appear characteristically impaired. They show a marked inability to engage with and direct another's attention and they do not use postures or gestures such as pointing to help other people share what they are experiencing or thinking about. Those that show greater abilities in joint attention are also more advanced in their use and understanding of language (Loveland and Landry, 1986; Mundy et al, 1990). Thus, it would appear that the core deficit has to do with the functions of language that are the basis for effective communication. Furthermore, joint attention deficits are associated with impairments in executive function skills, suggesting that autism is the result of a multiple disruption of a neuro-psychological system that is common to these psychological activities (McEvoy et al, 1993).

The difficulty that autistic children have in understanding others and in cultural learning as it is observed in their deficits for understanding and expressing emotional states and communicative messages, does not mean that they are insensitive to others and unaffected by who they are. It is reported that autistic children change the form or content of their communications depending on the social context. Freitag (1970) observed that autistic children show less positive response to an encouraging or supportive adult than control groups, but McHale, Simmeonsson, Marcus and Olley (1980) found a higher level of communicative behaviour among autistic children when a teacher was present rather than absent. Another study (Bernard-Opitz, 1982) revealed that an autistic boy communicated verbally more frequently with his mother and a clinician than with a stranger, and the level of communication was higher when the mother or the stranger responded to the child's initiations. In a study of play (Tiegerman and Primavera, 1981), it was found that the frequency and duration of object manipulation was higher when the experimenter imitated the child's behaviour. The effectiveness of imitating an autistic child for promoting social engagement between a mother and her child is confirmed by Dawson and Galpert (1990). The work of Nadel and Pezé confirms that autistic children, though they are abnormal in the reciprocation of imitative behaviours, can imitate, and an autistic child can become more communicative when their partner imitates them, developing

communicative exchange through imitation (Nadel and Pezé, 1993). Richer (1978), who accepts an ethological approach based on research into the instinctive control of animal communication and the theory of motivational conflict and avoidance of social contact, observed that autistic children's avoidance is often followed by, and may seek, an adult's approach. Clark and Rutter (1981) investigated the way certain types of social approach, e.g. high degree of structure combined with low interpersonal demands, facilitates interaction of autistic children with others. In contrast, Rydell and Mirenda (1991) found that although adult high constraint utterances (e.g. commands constraining the partner's behaviour, questions seeking for information) can elicit more verbal utterances and echolalia, probably as a coping strategy to reduce the cognitive demands, adult low constraint utterances (questions repeating or paraphrasing the partner's previous utterance and declaratives adding new information to the ongoing conversation) can elicit more subject high constraint utterances. A more recent study (Landry and Loveland, 1989) reported that autistic children did not show more attention-directing gestures (e.g. point, show, look and touch) and attention-directing language (e.g. this/that, here/there, I/my and you/your) compared to children with developmental language delay and normal development in a situation that was directed by an adult.

Although autistic people's communicative style is influenced by the interactive pattern of a partner, their social impairment appears not to reside in the degree of social and emotional responsiveness, but, in part, reflects a specific loss in comprehension of other people's emotions (Sigman and Mundy, 1989). This interpretation, which draws a distinction between the sensitivity of the autistic child to other known persons and the difficulty that the child has in reciprocating interests and points of view, is supported by studies that examined attachment behaviour in autism. It was shown that autistic children exhibit social responses to separation from and re-union with their caregivers and that they direct more social responses to their mothers than to strangers (Sigman and Ungerer, 1984b; Shapiro et al, 1987; Sigman and Mundy, 1989; Rogers et al, 1991). So, autistic children are not impaired in showing attachment behaviour toward their mothers.

Another way of understanding the communication problems in autism has been sought in the development of their cognitive skills. This approach stems mainly from Piagetian theory, in which development of the child's sensorimotor mental schemes for understanding objects of any kind is considered to be a necessary precursor for the acquisition of language. Curcio (1978) examined the sensorimotor development of mute autistic children and its relationship with the level of non-verbal communication. Those children with relatively complete sensorimotor functioning in object permanence and gestural imitation, means used for obtaining environmental benefits and causality, were claimed to be more inclined to exhibit spontaneous gestures of pointing or showing. He suggested that non-verbal autistic children have not developed language due to their failure in specific cognitive skills. However, autistic children are able to pass non-verbal Piagetian tasks on object permanence and classification of objects (Lancy and Goldstein, 1982) and are proficient in knowledge of function, form and colour categories. Their ability to categorize objects was found to be minimally related to receptive language. Thus, the language impairment cannot be attributed to delayed acquisition of categorization skills (Ungerer and Sigman, 1987). Sigman and Ungerer (1981) found that autistic children with good sensorimotor skills, in particular good object permanence, may, nevertheless, be impaired in language comprehension. Furthermore, Wetherby and Gaines (1982) reported for five echolalic autistic children that their stage of cognitive development in the areas of object permanence, causality, means-end and space exceeded that of language development. This suggests that, in fact, language acquisition does not depend only on sensorimotor skills.

5.3. Interaction of Autistic Children with their Mothers

The development of communication may be studied by directly examining the interaction between a mother and her child. This is a common method in developmental studies of infancy. It is based on the hypothesis that mothers can influence or support their children's development and that there is a reciprocal system operating in communication between mothers and children.

Mothers certainly can influence the development of their children's language acquisition, and children can also influence the speech of their mothers (Howlin et al, 1973; Howlin and Rutter, 1989). It has been found that mothers of autistic and dysphasic children adapt their conversation according to their children's level of comprehension rather than to their expressive language (Horsborough et al, 1985) and according to their children's cognitive functioning (Konstantareas et al, 1988). Early studies suggested that deviancies in parental speech were responsible for abnormal speech patterns seen in the language of schizophrenic (now called 'autistic') children (Goldfarb et al 1966; Goldfarb et al, 1972; Goldfarb et al, 1973). It was suggested that mothers of schizophrenic children were poorer in communicating mood and meaning (Goldfarb et al, 1966), tended to be more unclear and ambiguous in their communication (Goldfarb et al, 1972), and that their referential communication was less often characterized by high responsiveness, rich information and syntactical-grammatical structure (Goldfarb et al, 1973) than mothers of normally developing children. However, in the studies of Goldfarb and his colleagues the control group was not matched. Cantwell, Baker and Rutter (1977) used a comparison group of children with developmental receptive dysphasia matched on chronological age, non-verbal intelligence (with an IQ at least 70), and language level. No differences were found between the two groups of mothers in level of language usage, pattern of functional interaction and in overall clarity of communication. The only significant differences were that the mothers of autistic children made more affectionate or warm remarks and more elaborations, and used a neutral rather than a critical role when they disapproved of their children's behaviour. Other studies also suggest that mothers provide language environments for their autistic children not significantly different from those experienced by appropriately matched normally developing children (Wolchik and Harris, 1982; Wolchik, 1983) and by dysphasic children (Horsborough et al, 1985).

Another important factor in the child's development is the interpersonal communication with his/her mother. Research on mother-infant interaction presents evidence that reciprocal, affective and cooperative communication takes place, for which a normally

developing infant has innate motivation. Rutter (1983) stated that "Firstly, more than anything else, it is the reciprocity of social interchange that is missing in autism." -- (Rutter, 1983, p. 525), but only a few studies of autistic children give information relevant to this concept of development.

In a study examining 'communication' (behaviours such as point, give/show, give for help, touch and game), 'social responsiveness' (compliance or non-compliance to commands or suggestions) and 'social interaction' (eye contact, touching, vocalizations, smiling, on task and off-task behaviours) in a semi-structured situation, it was found that preschool autistic children infrequently shared their attention with their caregivers. They rarely pointed to an object, held an object up for the mother to see, or brought an object to her (Sigman et al, 1986). Moreover, they tried to elicit help from their caregivers and gave objects to them for assistance less often than groups of delayed and non-delayed children. No differences were found in 'social responsiveness', but this might be due to the quality of maternal directions which aimed at behaviour regulation rather than 'social interaction' or 'joint attention'. The conclusion is that the autistic children showed deficits in 'indicating' (joint attention) and 'requesting' behaviours and not in 'social interaction' and 'responsiveness'. Wetherby and Prutting (1984) revealed that although autistic children are able to regulate the experimenter's behaviour to obtain an environmental end, they are deficient in the ability to direct and attract the other's attention to an object or to themselves. Furthermore, the same findings have been reported in other studies of interaction with an experimenter (Mundy et al, 1986; Landry and Loveland, 1989). It has been also reported that children with a diagnosis of pervasive developmental disorder on DSM-III-R (most of whom met the criteria for autistic disorder) were impaired in affective responsiveness, showing less happiness or attention to their mothers (Trad et al, 1993).

In another study Kasari, Sigman, Mundy and Yirmiya (1988) examined the behaviours of caregivers toward the autistic children analysed in the study by Sigman, Mundy, Sherman and Ungerer (1986). They recorded the caregivers' 'attention regulation' behaviours (show,

point, model and eye contact), 'behaviour regulation' attempts (offer, prompt, hold on task and initiate task) and 'responsiveness' (mutual play, positive feedback and response to bids). The results revealed that mothers of autistic children often physically hold their children on task and praise their children more often than mothers of delayed and non-delayed children (Kasari et al, 1988). Another interesting finding of this study is that caregivers' behaviour correlated with the children's level of communication. Caregivers regulated their children's attention less and showed more mutual play and positive feedback to more communicative able children. This means that the more impaired the child is in 'sharing of attention', the more the caregiver is directive (Kasari et al, 1988). Furthermore, the less well children do, the more mothers use directives and short utterances and the more they reinforce motoric rather than spoken behaviour (Konstantareas et al, 1988). On the other hand, the fact that mothers often appear 'asynchronous' by directing or ignoring their children's activities, and are less successful than teachers in setting up 'dialogues' with them (Shapiro, Frosch and Arnold, 1987), indicates that mothers may not be as sensitive to their children's capacities, or as able to make appropriate adjustments of their communicative behaviour, as they could be.

Some studies have examined the speech acts of both parents and autistic children (Loveland et al, 1988) and the discourse skills of autistic children while they are interacting with their mothers (Tager-Flusberg and Anderson, 1991). Loveland, Landry, Hughes, Hall and McEvoy (1988) found that 9-year old autistic children matched with language delayed and non-delayed children responded less often, produced less affirming and turn-taking vocalizations and gestures, and rarely initiated communication. Their parents initiated more often and used more imperatives compared with the parents of the other two groups. Tager-Flusberg and Anderson (1991) compared the contingent discourse in the spontaneous speech of 5-year old autistic children matched on age and language level with Down's syndrome children, while they were communicating with their mothers at home over a period of one year. They found that autistic children's utterances were more non-contingent, failing to maintain the topic of their conversational partner and that they

showed no developmental change in their contingent discourse, especially in the categories that added new information.

The study of the interaction between a mother and her child, either verbal or non-verbal, has focused on the mother's or the child's communicative messages. There is a neglect of considering mother and child as a dyad which is involved in a dynamic system.

To summarize, -- the literature review, so far, has covered aspects of play and communication in normally developing and in autistic children. However, the studies presented and the issues discussed arose from studies of autistic children with relatively good cognitive and linguistic abilities. Issues about play and communication in autistic individuals who lack such skills and who function at a lower level are examined in the following section.

6. Development of Play and Communication in Low Functioning Children with Autism

Our knowledge about the behaviour and the level of play and communication in subgroups of autistic children is very limited. Although Kanner (1943) originally claimed that autistic children generally have good cognitive potentialities, it is now well established that autistic children's development varies depending on their level of intelligence. A high proportion of autistic children are developmentally delayed. These have poor social outcome and educational progress, fail to develop speech and many of them become epileptic later in life (Carr, 1976). Low-functioning autistic children may loose communication that they had once acquired (regression), and they display greater variability across developmental domains (Burack and Volkmar, 1992).

Behavioural characteristics differ between higher and lower functioning autistic children. Bartak and Rutter (1976) found that autistic children with a non-verbal IQ above 70 showed a different pattern of symptoms from those with an IQ below 70. Both groups of children showed defining features of the autistic syndrome, having impaired development of social relationships, delayed and deviant language development, ritualistic behaviours and disturbed social behaviour.

However, the lower functioning children showed a more severely autistic picture. In particular, they had greater language impairment, showed more disturbed social relationships and more self injurious behaviours and stereotyped movements. On the other hand, the higher functioning group used more pronominal reversal in their speech, were more sensitive to noise and exhibited more ritualistic behaviour. Freeman, Ritvo, Schroth, Tonick, Guthrie and Wake (1981) confirmed Bartak and Rutter's findings when they examined the behaviours of higher and lower functioning autistic groups in comparison with groups of developmentally-delayed and non-delayed children.

Researchers aware of the cognitive discrepancy between subgroups of autistic children have studied patterns of maternal speech toward the higher and lower functioning autistic children (Howlin et al, 1973; Konstantareas et al, 1988), their communication (Curcio, 1978; Stone and Caro-Martinez, 1990) and sensorimotor functioning (Curcio, 1978), and the development of play (Ungerer and Sigman, 1981).

Howlin, Cantwell, Marchant, Berger and Rutter (1973), in a pilot study of five single cases, examined the speech patterns of speaking and non-speaking autistic children and those of their mothers while they were interacting. They found that mothers of non-speaking autistic children used a high proportion of directions and questions, which dropped as the child started to develop speech, and a low frequency of corrections and prompts. Mothers of speaking autistic children used more questions than directions, showed a high frequency of corrections and prompts, and reinforced their children more than mothers of non-speaking autistic children. The mothers' imitative speech in both groups was related to the total amount of speech used by the children. Both non-speaking and speaking autistic children did not use questions. Konstantareas, Zajademan, Homatidis and McCabe (1988) reported similar findings. They included two groups approximately 6 years old; the higher functioning group had a non-verbal IQ of 89 on the Leiter International Performance Scale (Leiter, 1980) and their language was about the 4-year level, while the children in the lower functioning group were untestable on the Leiter being functionally mute. These authors found that the mothers of the higher functioning verbal group used more expansions

and corrections of their children's utterances, reinforced their children for their utterances, asked more questions and answered more questions. By contrast, mothers of the lower functioning non-verbal group used more directives and reinforced their children for their motor behaviour.

Others have concentrated more on the low functioning autistic children. Curcio (1978) described the sensorimotor functioning and communication of 12 mute autistic children. He found that these children were not severely impaired on the object permanence scale, but they failed to imitate any actions and to use proto-declaratives such as pointing and showing. Stone and Caro-Martinez (1990) observed the spontaneous communication of autistic children with a mean chronological age of 8 years on different occasions of their school life. They distinguished their groups into those who displayed speech and those without speech. They found that children with speech used more gestures, more different communicative functions, more commenting and more giving information than the non-verbal group. They also reported that individuals with an IQ below 50 less often established joint attention by means of commenting and giving information.

Ungerer and Sigman (1981) examined the 'sensorimotor', 'relational', 'functional' and 'symbolic' play in a group consisting of 16 4-years old autistic children while they were interacting with an experimenter. The experimenter modelled and used verbal cues to direct the child verbally in the functional and symbolic use of objects. The children were divided into two sub-groups of a high and a low language comprehension group. The children were functioning at the 2-year level on the Cattell Scale and at the 3-year level on the Merill-Palmer Scale. It was found that the high language group used more 'functional' play and substitution 'symbolic' play, and also performed multi-scheme sequences.

Other researchers did not divide their subjects initially into high and low functioning groups, but later in analysing their data, they used correlation tests to investigate any relationships that emerged between communication and level of intelligence. McHale, Simmeonsson, Marcus and Olley (1980) found that IQ was related to communication and Mundy, Sigman, Ungerer and Sherman (1987) reported a positive

association between mental age and language on the one hand, and joint attention, 'functional' and 'symbolic' play on the other hand.

It is apparent that low-functioning autistic children not only show different behavioural characteristics compared with the high-functioning autistic children, but also exhibit a different pattern of communication and play. However, the studies reported until now are limited to the examination of maternal speech, to children's ability for imitation, pointing and solitary play. Many other issues merit examination regarding the level of play and verbal/non-verbal communication, with the child's chronological and verbal mental age taken into account.

7. Development of Communicative Play in Normally Developing Children and in Children with Autism

Play has been associated with the acquisition of language and in a framework of a theory of interaction. This link must exist if one accepts Halliday's (1979) notion that learning language is learning how to 'mean' through a social learning of experiences. In this way, the child does not merely acquire knowledge about what words refer to, but gains understanding of the meanings of the others' intentional acts, which can be communicated by both verbal and non-verbal means. Furthermore, play is an element of social interaction. Smith (1977) expresses this view as follows:

> "Social play is one form of social interaction. Social interaction implies that two or more participants are making appropriate responses to each other so that the sequence of interactions is continued - they are making alternating and contingent responses to their partner or partners. Play is generally taken to imply a sequence of behaviours which shows marked combinatorial flexibility. . . If these characteristics are accepted, then social play must have the characteristics of both social interaction and play." -- (Smith, 1977, p. 123).

Social play has been studied in the playful interactions of children with their mothers or with their peers. The value of skilled participants, who can be either caregivers or peers, in interactions with children has

been described by Rogoff (1990) using the concept of 'guided participation', which involves ". . . children and their caregivers and companions in the collaborative processes. . . . Underlying the process of guided participation is intersubjectivity: a sharing of focus and purpose between children and their more skilled partners . . . " -- (Rogoff, 1990, p. 8).

Parten (1932) was the first to classify children's social play with peers. She distinguished play into social categories such as 'solitary' play, 'unoccupied', 'onlooker', 'parallel' and 'associative' play. In 'solitary' the child plays alone and independently with whatever toys are of interest. When 'unoccupied', the child does not appear to be engaged with anything specific and his behaviour seems aimless. As 'onlooker' the child watches the play but does not enter into the play, while in 'parallel' play the child plays independently and beside rather than with other children. In 'associative' play the child plays with other children but their play is not organized and during 'cooperative' play the child plays in a group with activities organized for some purpose. Garvey (1972) described the dyadic play of peers as 'nonsocial' when one or both peers engage independently in an imaginative activity, and as 'social' or 'ritual' when both children are mutually engaged in, for example, a housekeeping activity. Others have suggested that negotiations (Göncü, 1987), intersubjectivity (Göncü, 1992) and establishment of shared objects (Werner and Kaplan, 1963) or a shared world (Giffin, 1984; Nelson and Seidman, 1984) are elementary foundational features in children's acquisition of pretend play.

Empirical studies have been carried out to investigate the mothers' role in play with young children. Dunn and Wooding (1977) observed the play of 24 children between 18 and 24 months when their mothers were doing some housework or were relaxing. They defined two levels of maternal involvement: 'joint attention' to indicate that the mother was looking at the child's play and commenting on it, and 'joint play' when the mother actively took part in the child's activity. They found that pretend play took place when the children were in joint attention with their mothers or were seeking their mothers' attention, and that the mothers' initiations were mainly focused on pretend play

activities. Similarly, Zukow (1986) and Fiese (1990) found that children's performance during interactive play sequences with their caregivers in the second year was significantly more advanced than non-interactive sequences. At the same period of development, children and mothers are playing at parallel levels and change in one partner's 'symbolic' play is associated with changes in the other partner's play (Tamis-LeMonda and Bornstein, 1991). The fact that reciprocity and turn-taking can lead to 'symbolic' play confirms the intersubjective basis of this complex level of play. In contrast, simpler forms of play, such as 'manipulative' play, are more dependent on maternal direction and instruction (Fiese, 1990).

At 2 years children could enact mothering behaviours to a doll with the help of their mothers, as well on their own. Six months later, children showed more elaborate mothering behaviours independently and their mothers tended to observe their play and suggested more elaborate activities (Miller and Garvey, 1984). O'Connell and Bretherton (1984) found that the play of 20- and 28-month olds was generally more diverse in collaborative sessions with the mother than when they play alone. Also, 20-month olds showed an increase in exploratory and combinatorial play, while 28-month olds showed an increase only in symbolic play during play with their mothers. The mothers of the 20-month and 28-month olds gave the same amount of suggestions for symbolic play, but only the 28-month old children readily accepted their mothers' suggestions (O'Connell and Bretherton, 1984). Similarly, Slade (1987) investigated the effects of maternal involvement on symbolic play during the period from 20 to 28 months of age. Maternal involvement was distinguished into three categories: 'no involvement' in child's play, 'commentary' when the mother uses affirmative or elaborative comments and 'interaction' when the mother is actively involved in play or suggests pretend activities. She found that 'interaction' was associated with lengthier and higher-levels of symbolic play than the category 'commentary'; 'commentary' was also associated with lengthier and higher levels of symbolic play than 'no involvement'. Overall, these results support Vygotsky's (1978) and Bateson's (1955) claim that children gain cultural knowledge through social interaction and Rogoff's (1990) description of learning as occurring by means of 'guided participation'.

Given the above indications of how important the intersubjective factors are in the development of play, it is remarkable that there are no studies examining the qualities of autistic children's play in a social context. There are a few studies with peers, but the analysis of the data has not focused on categories of play such as 'sensorimotor', 'relational', 'functional' and 'symbolic' and on the level of interpersonal contact, but on the communicative quality of peer interaction and how this interactional process is influenced depending on the familiarity of the observational setting, on the developmental level and behaviour of the interactive partner, on the acquisition of basic social skills, and on the structure and amount of interaction (Howlin, 1986; Lord and Magill, 1989).

8. TOWARDS A SYNTHESIS

In this final section of the literature review, the issues presented above are summarised and critical points for developing a new framework for examining autism and designing the current research are discussed.

8.1. Summary of the Literature Review and Critical Issues - An Alternative Psychological Model

Infants are ready from birth to establish communication with their caretakers by means of emotional or motivational expressions and sensitivities, imitation and vocalizations. With appropriate support from an identified and affectionate caretaker, they communicate at this proto-conversational level elaborately and efficiently before they begin manipulative testing of objects. After infancy, toddlers develop representations, conventional and socio-dramatic play as they learn language. They also develop cooperative skills with peers, competent performance in tasks and share their imaginative play in communication. The examination of the relationship between symbolic play and cooperative understanding can lead to identification of symbolic precursors to communicative development, or communicative precursors to symbolic development. Of these developments, the ones that relate to 'symbolic' play and intersubjective communication, which

normally lead a child towards proficiency in cultural meaning, have been mostly reported to be impaired in autism.

Current psychological models for explaining the nature of the autistic disorder are not adequate because they are limited to specific impairments found in the development of fragmentary functions of cognition, communication and emotion, -- e.g. deficits are identified in 'language', 'theory of mind', 'executive functions', 'joint attention' and 'emotion perception/expression'. They fail to examine the essential holistic nature of the disorder. If it is accepted that affect is independent of and prior to cognitive processes as proposed by Zajonc (1980), then it follows that impairments in 'language', 'theory of mind' and 'executive functions' cannot explain the autistic disorder because all these psychological abilities appear late in development. Study of deficits in 'joint attention' and 'emotion perception/expression' is more likely to lead to an understanding of autism, because these are fundamental elements of the interpersonal process.

In this thesis, Hobson's definition of 'affect' will be accepted as being ". . . largely concerned with modes of interpersonal perception and responsiveness that result in experiential as well as behavioural coordination between and across individuals. So called 'affect' is the original means to and mode of 'primary intersubjectivity'." -- (Hobson, 1993, p. 213).

Trevarthen (1979a) who first used the term 'primary intersubjectivity' in his descriptions of the interaction between mothers and their infants, argues that interpersonal communication is characterized by transmission and feedback of emotional information and sharing of control. Infants can share mental control with other people if they have two skills: a) subjectivity, wherein they exhibit to others the rudiments of individual consciousness and intentionality, and b) intersubjectivity, by means of which they are able to adapt or fit this subjective control to the subjectivity of others. In a dyadic exchange, infants adapt to expressions of the mother and the mother generates expressions adapted to her infant's changing interest. Infant expressions, infant responses, maternal expression and maternal responses are the

four main functions which are present in a dyadic intersubjective communication.

In the above review of studies of the autistic population, it is found that, by and large, affective contact in terms of intersubjectivity has not been examined. When communication has been examined it has been defined in terms of physical proximity, intentionality, pragmatics and joint attention. Furthermore, play has not been studied in an interactive situation, communication has not been observed in a spontaneous play situation within a reciprocal system, and the quality of the interpersonal engagement between a mother and her autistic child has not been investigated. However, studies and theories of normal development have indicated that there is a clear association between play, communication and interpersonal involvement. They appear as originally interdependent functions in infancy -- play is a precursor of communication and communication enhances the development of play with a potential communicative partner.

To correct the above neglect of interpersonal functions, the aim of this research will not be to study the autistic children's play in relation to their language development, nor to describe spontaneous play vs elicited play, but to observe the interactive and play patterns in which autistic children of preschool age engage with their mothers, and at the same time, the interactive and play patterns by means of which mothers of autistic children respond to their children.

The value of naturalistic observations for autistic and normally developing children, in contrast to experimental and structured situations has been expressed as follows:

> ". . . autistic children's use of gestural, vocal, and verbal behaviour should be studied in naturally occurring interactions in order to help to elucidate how these behaviours function for the autistic child." -- (Wetherby, 1986, p. 298), and
>
> "The great power of naturalistic observation is that we can see what the child herself is interested in or curious about, and can examine her abilities in situations that are of emotional significance, interest or importance to her. What stands out from such observations is

the great interest that children show in other people's behaviour . . ." -- (Dunn, 1991, p. 61).

In addition to the value of naturalistic studies in the autistic population, there is a need ". . . for researchers to acknowledge the heterogeneity within the autistic population. . . ", and also, ". . . for more fine-grained research strategies. . . " to ". . . differentiate among autistic persons by factors such as etiology, organic impairment, language skills and intellectual functioning." -- (Burrack and Volkmar, 1992, p. 614). Furthermore, studies of maternal speech have shown that the mothers' speech can be influenced by the child's chronological age, cognitive and linguistic level, and receptive and expressive abilities (Horsborough et al, 1985). Therefore, it is important to distinguish between verbal and pre-verbal groups so that an appropriate developmental approach for assessment and intervention can be applied.

Apart from the methodological problems, the interpretation of the findings regarding the relationship between play and communication is puzzling because results are inferred a) from differing testing procedures (e.g. in the study of Mundy, Sigman, Ungerer and Sherman (1987) a scale was used for assessing communication but play was observed separately), and b) by comparing data across different studies with the consequent effect of confounding between participants' differences in chronological age, language skills, cognitive level and severity of autism.

Therefore it is important to overcome the problems in planning research by studying the communicative aspects of play because this can have a significant role not only in furthering our understanding of the processes of social interaction in autism but also in gathering important information for enhancing our understanding of this condition and approaches to intervention.

By accepting a model of how others' playful and communicative internal states are perceived in a dyadic system of communication controlled by reciprocity and feedback of information about motivation and emotion, the effect of an autistic child's behaviour on his or her mother is better understood. Stern (1974) describes this effect in infancy.

> "If the infant is deficient or delayed in his development of facial expressiveness and other social acts, most commonly because of brain damage, it is the mother who is placed in a situation of relative stimulus deprivation. Fewer infant-elicited variations of her behaviour will be evoked, and when they are, they will be maintained with greater effort. The mother, in turn, becomes less stimulating to her infant, and a 'vicious' cycle is entered. Again, the level of mutual stimulation within the dyad will remain low." -- (Stern, 1974, p. 410).

However, not only can the child influence his/her mother's behaviour but the converse can happen. Mothers with psychological problems can influence the interaction with their infant negatively (Murray and Stein, 1989). Infants experiencing difficulties during interactions with their mothers are distressed and seek engagement unsuccessfully, while infants with mothers who show intrusive behaviour tend to look away (Cohn and Tronick, 1989).

Thus, it is apparent that a deviance in the child's or the mother's behaviour can negatively influence the interactive processes of the dyad. In the case of autism, one can formulate the hypothesis that since the child's autistic behaviour does not provide enough information for encouraging the mother's response, this would result in unsuccessful and negative communicative approaches by the mother. So, the lack of feedback by both partners creates a vicious circle in the interaction between an autistic child and his/her mother.

8.2. Strategy for Planning this Research

The literature about play, communication and communicative play in normal development and in autism provided the background for conducting the current research. A Pilot Study and a Main Study were designed to examine the issues which had been largely neglected in previous research. The issues mentioned below are mainly relevant to the Main Study, but it was necessary to carry out a Pilot Study first (see Chapter 3, Section 1: Aims of the Pilot Study). The Main Study consisted of two smaller studies (Study A and Study B). These both used the same procedure for data collection and the same coding instrument for

analysis of the videotapes was applied. The only difference lies in the composition of the groups which participated in Studies A and B. Study A compares verbal autistic children with developmentally-delayed and non-delayed children, and Study B compares the same verbal autistic children with pre-verbal autistic children. The detailed strategy for the research was as follows:

- To collect observational data in a natural setting such as the home situation with a familiar partner, i.e. the mother.
- To include autistic children in the age range of 3 to 6 years, since this is the period when symbolic play is prevalent in normally developing children and when autistic children should be interested in play according to their chronological age.
- To use a measure of language development for matching autistic children and their comparison groups, in the knowledge that play and language are correlated and that the degree of the language impairment is the most representative aspect of the cognitive disabilities of the autistic children.
- To match autistic children and their comparison groups at the level of language ability of normally developing children around 2 years old, since 'symbolic' play emerges at this developmental period.
- To include a second group of pre-verbal autistic children to be compared with the verbal autistic children at an exploratory level, knowing that these two groups are not equal in their cognitive development. The division of the groups would be based on information from questionnaires (a Subject Selection Inventory).
- To analyse play and communication in the same context, so that conclusions about the relationship between communication and play are justified because these are based on results stemming from the same situation and from the same subjects.
- To develop a coding scheme in which both non-verbal/prelinguistic messages and linguistic messages are classified as equally important parts of communication. This coding scheme is to define exploratory behaviour in play, so that acts that include inquiring about properties of novel toys (answering the question 'what is this?') and social exploration of the immediate environment are

integrated. Exploratory play does not merely consist of 'secondary circular reactions', but is a more advanced form of play behaviour and may be communicative.

- To examine play and communication in terms of intersubjectivity, meaning that play and communication between a mother and her child is regulated by experiences and feedback of information. For this, play must be examined at the level of 'initiations' and 'responses', and the functional behavioural concept of 'Interpersonal Engagement' is introduced. It was expected that play in the autistic children would be characterized by lack of cooperation and by disengagement of the mother from her autistic child due to the affective problems associated with autism.

This, then, is the main theoretical background and these are the arguments to be explored in this research. First the Pilot Study and its function in designing the Main Study will be presented. Later, the Methodology of the Main Study and the Coding Instrument for the analysis of the video data will be discussed in detail.

CHAPTER 3 PILOT STUDY

1. AIMS OF THE PILOT STUDY

Following a review of the literature on communication and play in young autistic children, a Pilot Study was planned to help in the design of the Main Study. The researcher used the Pilot Study for the following purposes:

- to gain experience using the recording equipment
- to decide about the most appropriate materials and situation, and the duration of play session that would give adequate information for data analysis
- to obtain a sample of tapes on which to practice methods of analysis
- to develop a questionnaire for parents to obtain information about the behaviour and family situation of a representative sample of autistic children.

Case studies were made of three autistic preschool children. Qualitative data were collected on their play and communication with their mothers in a hospital play-room and at home. A preliminary examination was made of how Video Tape Recorded Playback (VTRP) might be used to improve the interaction between these autistic children and their mothers.

The plan of the Pilot Study was guided by the following claims:

- the central problem in autism stems from the lack of the ability for affective contact (Kanner, 1943), emotional recognition (Hobson et al, 1988a, 1988b) and joint attention (Mundy et al, 1986; Sigman et al, 1986)
- mothers are directive during interaction with their autistic children (Kasari et al, 1988) and asynchronous in dialogues with them, failing to maintain joint attention (Shapiro, Frosch and Arnold, 1987), and
- a form of training known as Video Tape Recorded Playback (VTRP) improves communication (Berger, 1978).

While the main purpose of the Pilot Study was to practise subject recruitment, recording and analysis of play between autistic children and their mothers, it was also felt worthwhile to examine whether or not VTRP of a mother's intrusive behaviour with her child would help her achieve better communication.

Having an autistic child in the family creates stress, mainly when the child is in the preschool age and spends most of his/her time at home. Different approaches have been applied for the treatment of the autistic children. Bettelheim (1967) emphasized separation from the parents while Lovaas, Koegel, Simmons and Long (1973) applied an intervention approach based on reinforcement procedures. Tinbergen and Tinbergen (1983) suggested holding therapy, in which the mother holds the child closely until the child establishes eye-contact, relaxes and talks.

In behaviour therapy, the technique of VTRP is widely used. Certain aspects of the patient's behaviour are videotaped and later played back to the patient. The use of this technique varies according to a) the amount of the material replayed, e.g. the whole session or selected parts, b) the conditions under which playback occurs, e.g. the whole session or selected parts, and c) the timing of the playback, e.g. immediate or delayed (Hugh and Rosenthal, 1981). The use of video is important in treatment of disturbed people because it gives the opportunity to experience and become aware of the way that individuals act (Berger, 1978) and because

> "Video is a vehicle for discussion; video permits detailed observation; video sees things that humans do not; video has a distancing effect; video shares information and video trains in observation and handling techniques." (Evans and Clifford, 1976, p. 129).

Although it would have been fruitful to analyse thoroughly the video playback recordings and the mothers' responses to them, due to lack of time these were, in the end, not subjected to detailed analysis but were reviewed to provide a provisional summary that will be useful for future research.

2. SUBJECT SELECTION

Three autistic children, between $3\frac{1}{2}$ and $4\frac{1}{2}$ years old, and their mothers participated in the Pilot Study (Table 3.1). They were identified through the Communication Disorder Programme of the Department of Child and Family Psychiatry at the Royal Hospital for Sick Children, Yorkhill, Glasgow. The children were accompanying their mothers to the hospital as out-patients to attend therapy sessions (Table 3.2). Once ethical approval was gained, the researcher discussed with the consultant psychiatrist the selection of children receiving a diagnosis of 'autistic disorder' according to the most widely used diagnostic system, DSM-III-R (1987).

It was necessary to gather additional information about the profile of each child referred, to confirm that a representative group had been selected and to obtain as clear a picture as possible of each child's autism. Since access to the children's files was not permitted, for reasons of confidentiality, the researcher created a questionnaire, called Subject Selection Inventory (SSI) (Appendix I.A.), which was later used with slight modification in the Main Study. The SSI is based on Kanner's (1943) description of 11 cases of 'infantile autism' with additional components to record features found in subsequent studies to be typically deviant in autistic children. It was decided that Kanner's original intuitive conception of autism gave the most accurate general picture of the disorder. As has been mentioned in the Introduction, recent trends in defining autism have been rather confusing, apparently drawing attention away from the core pathology affecting interpersonal communication that was clearly recognised by Kanner. The SSI was completed with the assistance of the consultant psychiatrist and the therapists at the Royal Hospital for Sick Children, who were familiar

with the children and their families, in order to obtain a clear picture about the child's autism.

After children were selected to participate in the study, parents were informed by the consultant psychiatrist about the study and were asked if they would be willing to receive more information with a view to taking part. All agreed, and the researcher met each mother and observed each child in therapy sessions so that both of them would be familiar with the presence of the researcher prior to the filming situation. Then mothers were informed about the date and duration of each procedure, and they were asked to sign informed consent forms (Appendix I.B.). They were also requested to look carefully over the completed questionnaires and to comment on the questions. They were asked whether or not they agreed with inclusion of the topics mentioned, and to add any important items that they felt had been overlooked.

Various standardized psychological tests were also used to complete a thorough profile of each subject. The clinical psychologist administered the Stanford-Binet Intelligence Scale 4th edition (1985), the Leiter International Performance Scale Battery for Children (Leiter, 1980) and the Merill-Palmer Preschool Performance Scale. The speech therapist administered the Reynell Developmental Language Scales 2nd Revision (Reynell and Huntley, 1985) (Table 3.3).

Qualitative data on play and communication for normal children of equivalent mental age were taken from tapes in the collection of Prof. C. Trevarthen for practice in analysis and comparison. These recordings included children from 3 $^1/_2$ to 4 $^1/_2$ years of age playing with their mothers in a situation comparable with that used in the hospital observation of the autistic children.

Table 3.1: Profiles of the three Children and their Families

NAME[1]	Robin	George	Betty
SEX	male	male	female
CHRONOLOGICAL AGE	44 months	51 months	52 months
AGE OF ONSET	18 months	6 months	12 months
DELIVERY	caesarian section	caesarian section	normal
FULL-TERM	full-term	full-term	full-term
NEUROLOGICAL ABNORMALITY	not found	not found	not found
BRAIN PATHOLOGY	not found	not found	not found
PHYSICAL ILLNESS	past viral illness	past ear infection	none
ORDINAL POSITION	first	second	eleventh
PRIMARY CAREGIVER	mother	mother	mother
MOTHER'S OCCUPATION	housewife	housewife	housewife
FATHER'S OCCUPATION	–	engineer	painter
FAMILY'S NATIONALITY	British	British	British
HANDICAPS or PSYCHIATRIC ILLNESS IN PARENTS	none	none	father had manic illness in the past
PARENTS	separated	live together	live together

Table 3.2: Attendance at the Communication Disorder Programme

NAME	Robin	George	Betty
TIME IN TREATMENT PRIOR TO THIS STUDY	13 months	6 months	10 months
PROGRAMME OF TREATMENT DURING THE STUDY (Number of 30 minute sessions per week)			
Clinical Psychologist	2	1	2
Speech Therapist	2	1	1
Occupational Therapist	2	2	2
Teacher	–	1	2

[1] The names of children used in the Pilot Study are fictional.

Table 3.3: Chronological and Mental Age on Stanford-Binet, Leiter, Merill-Palmer and Reynell

NAME	Robin	George	Betty
SEX	male	male	female
CHRONOLOGICAL AGE	44 months	51 months	52 months
MENTAL AGE			
Stanford-Binet	*	38 months	46 months
Leiter	51 months	-------	-------
Merill-Palmer	37 months	46 months	51 months
Reynell	12 months	30 months	32 months

------- The Leiter was not administered; it was replaced by the Merill-Palmer.
* The clinical psychologist felt that this test was not applicable for this case because Robin was mainly pre-verbal.

3. DATA COLLECTION

Autistic children and their mothers were observed in two different situations. One observation took place at the hospital to examine more complicated issues, and the second one in a familiar setting, the home.

3.1. Mother-Child Interaction

3.1.1. Part 1: Hospital Observation

Mothers and children were videotaped as they interacted with toys under various semi-structured conditions without time limitation. The approximate duration of this session was 10 minutes for Robin, 23 minutes for George and 35 minutes for Betty. Interactions took place in a quiet room of the hospital which included a chair for the mother, a table and a child's chair for the child. The toys included a push-and-go fire engine which was used as a warm-up toy, a bed, a mattress, a pillow, a blanket, a doll, a dog, an iron, two cups, two saucers, two spoons, a bottle with liquid, a teapot, a car, a bath, a sponge, a towel and a brush. The following written guidelines were given to the mother prior to the filming:

When you enter into the room a toy (push-and-go fire engine) will be on the table just to take the attention of your child. A box with toys will be beside you. Try to make sure that all toys are used while you are playing with your child. Act as naturally as possible. When the researcher says "that's good", please stop initiating any activity, lay the toys on the table and leave your child to play alone; if the child plays too long with a toy, please encourage him/her to play with another one. When the researcher says "that's enough", please put the toys back in the box and afterwards try to obtain your child's physical contact. When the filming is finished and your child returns to his/her session with the therapist, please complete the form below.

The mother was presented with a short structured questionnaire called the Noble Semantic Differential Measure (NSDM), developed by Rodney Noble (1983) to assess the mother's perception of herself and her child, and used also by Trevarthen and Marwick (1982) (Appendix I.C.). Questions are asked about the image of 'the mother for herself' (me), the image of 'the mother for herself as a mother' (myself as a mother), the image of 'the mother for her child' (my child) and 'for the relationship with her child' (my relationship with my child). The NSDM was slightly modified for this study: guidelines on how to complete it were given to the mothers and a seven point scale was used instead of the ten point scale of the original test.

3.1.2. Part 2: Home Observation

About a week after the filming at the hospital, mothers and children were videotaped without time limitation at home as they interacted with the child's own familiar toys and toys selected as a standard set for the study. The latter included a pagoda (which requires the child to lock and unlock the doors of a polygon box with keys according to colour, and to put the shapes in the right slot), a lotto game (which requires the child to match pictures), a jigsaw and two books. Mothers were asked to be alone with the child at home when the home observation was carried out. The approximate duration of this session was 40 minutes for Robin, 30 minutes for George and 35 minutes for Betty. Mothers were informed orally how to use the pagoda and the lotto

toys. Finally the mothers were asked to complete the NSDM again after the filming.

3.2. Video Tape Recorded Playback (VTRP)

After an interval of two weeks, mothers were invited to view the tape which was recorded during the hospital observation. While the VTRP was being carried out with Betty's mother, a therapist interrupted us near the beginning of the session and informed the mother that Betty had to leave because she was ill. So, the VTRP for Betty's mother was repeated later, three weeks after the first video recording at hospital.

The session recorded at the hospital observation was selected to be played back to the mothers because it provides the same situation for all the dyads and because it involves play with toys, which are likely to elicit symbolic play. Deficient symbolic play is considered to be a distinctive feature of the autistic disorder (Wing et al, 1977; Baron-Cohen, 1987).

The VTRP lasted 45 to 60 minutes. The whole procedure was video recorded. First, the video playback equipment was explained and the use of the remote control was demonstrated. Then the following written guidelines were given to the mothers:

> *In a few minutes you are going to watch yourself interacting with your child. You will have the opportunity to view the tape once. You will view the tape again, but this time, when you want to comment on yourself or on your child or on the communication between you and your child, please press the button 'stop'. Please make the comments orally; speak and the microphone will record your voice. You can make comments as many times as you feel the need to express your thoughts and your emotions. When you finish your comments on a part of the tape, press the button 'play' to view the rest of the tape. If you wish, do not press the button 'stop' to comment, but simply make your comments orally while you are viewing the tape. Afterwards, when the tape is finished, the researcher will ask you to view some preselected by her portions to comment on these. When the session is finished, please complete the forms below. Please answer all the questions.*

At first, mothers were not asked to comment on the tape. They were given an opportunity to become familiar with their TV image and with the picture of the interaction with their children. Mothers were prompted to stop the tape and comment instead of commenting while the tape was running, to avoid the possibility of losing important information. However, they were given the option of free commentary if they felt that stopping the tape was confusing.

The selected portions were each about 1 minute in duration. Two were events initiated by the mother, two were events initiated by the child independently, and two were events which focused on the interaction between the mother and the child. First, all the portions were played back at normal speed, and then a few were reviewed frame-by-frame.

Portions were selected to be played back for two reasons. First, an important aspect of VTRP is focused feedback, meaning that attention is paid to only a single dimension of the observed behaviour at a time (Durett and Kelly, 1972). Second, it was thought that mothers might be "unable" to comment by themselves and that a stimulus would be needed to encourage them. In addition, mothers were asked first to complete a short questionnaire (Appendix I.D.) developed by the researcher and the Noble Semantic Differential Measure, described above. As the questionnaire elicits comments from the mother, it was hoped that this would counteract any reluctance to comment while she was viewing the tape.

It was originally intended to film mothers and children again in the same situation a day after the VTRP. It was believed that time should be given to the mothers to think about the interaction with their children before any further filming was carried out. However, an impending interruption of the Communication Disorder Programme in a holiday period made it necessary to film mothers and children on the same day, a few minutes after the VTRP. The filming lasted approximately 10-15 minutes and followed the same procedure as in the hospital observation.

3.3. Filming Situation

Alternative filming situations used for the Pilot Study were as diagramed below. Scheme 1 was expected to encourage eye contact and cooperation between mother and child. However, mothers found it difficult to cope with the child's off task behaviour in this arrangement, and therefore Scheme 2 was adopted.

Figure 3.1: Intended Filming Situation

SCHEME 1

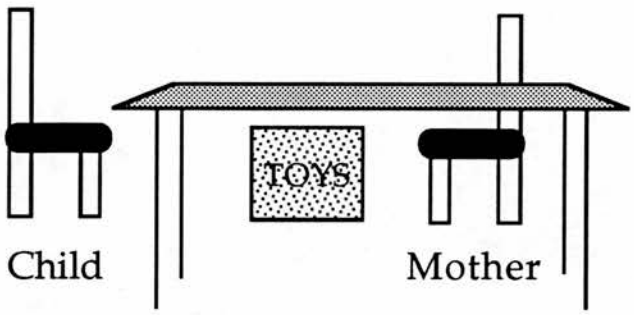
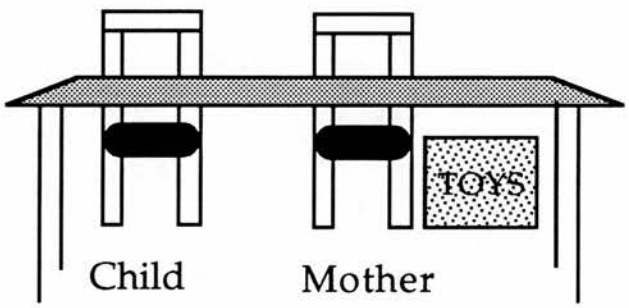


Figure 3.2: Revised Filming Situation

SCHEME 2



3.4. Equipment and Editing

Mothers and children were videotaped at the hospital and at home on VHS Maxell E-180 tapes with a NV-MS Panasonic VHS Video Camcorder mounted on a Panasonic WV-T20E tripod. The Camcorder and the tripod were situated in front of the mother-child dyad.

The master tapes were copied to new tapes in a Panasonic VHS Edit Suite which included an AG-6200 Source Machine, an NV-8500 Edit Machine, an NV-A500 Edit Controller and a GYYR Video Timer Model G-77. The copies indicated the time digitally in minutes, seconds and hundredths of a second, which facilitated data analysis.

Recordings made at hospital and at home were viewed by the researcher several times. It was decided that only selected parts should be played back to the mother. These parts were edited onto a new tape for each child using the equipment described above. This tape was played back to the mothers with a Panasonic/Player VHS monitor AG-500. A Panasonic VHS portable Video Cassette Recorder NV-180 was used to record the whole procedure of the VTRP. Two Sony Microphones were used, one attached to the mother and one to the researcher. They were connected with the Panasonic VHS portable Video Cassette Recorder NV-180. A Sony Microphone Mixer MX-10L was used to adjust the balance of volume between the speech from the tape played back and the concurrent live discussion.

4. COMMENTS ON THE PILOT STUDY

Data collected during all parts of the Pilot Study were considered to be generally representative of each child's behaviour. Mothers stated that the child acted much as usual. However, when Betty was playing with her mother after VTRP, according to her mother, the tape was considered not representative of her normal behaviour because she was exceptionally restless.

All mothers found it a difficult task to stop the tape and comment on it. Robin's and George's mothers appeared very sensitive about the child's problem and their own directive strategy. This is evident both

from their reactions to their own recorded behaviour in VTRP, and from the responses to the completed form. Only Betty's mother appeared less aware of her role in the play situation. Although she wrote on the form, "I felt I could have given Betty more time to do the things before I helped her", she also wrote, that there was nothing that she would have liked to change.

Attitudes recorded on NSDM were changed after VTRP. However, this might be due to a change in the mothers' mood, not to the influence of VTRP. Repeated VTRP's are needed to bring evidence for its efficacy to aid mothers' self awareness.

Regarding the possibility of improvement in the child's communicative behaviour and in the mother's communicative strategy after VTRP, the results are ambiguous. There was no improvement in the interaction between Robin and his mother. It is difficult to judge the effects of VTRP because Robin and his mother were suffering from lack of sleep and they could not concentrate on play. Furthermore, his mother let him to be obsessed with ironing, his favourite task. George and his mother seemed to have a different way of interacting after the mother had experienced VTRP; the mother directed the session less and the child initiated more play acts. There was no change in the interaction between Betty and her mother. This might be because Betty was restless, as mentioned above. These comments are first impressions and might not prove to be valid if the behaviour on the tapes were analyzed in more detail and assessed quantitatively.

The Pilot Study was taken as a basis for the design of the Main Study. In particular, it was decided that:

- mothers and children should be filmed at home with symbolic play toys, representing familiar meaningful objects
- 15-20 minutes allows enough time for the child-mother dyad to complete a representative play session
- mothers and children should be filmed in a different situation (see Figure 4.2 and 4.3 in Chapter 4, Section 6: Filming Procedure and Equipment for Study A and Study B) to maximize the possibility for

cooperation and to help the mother to cope with the child's off task behaviours

- the SSI should be revised on the basis of the feedback from professionals and parents
- the tapes recorded at the hospital, at the home and after VTRP provided a basis for data analysis and the development of a coding scheme. It was decided that an event recording procedure (Bakeman and Gottman, 1986) should be used, and that onset and offset times should be noted
- in a future VTRP study the preselected portions should be of longer duration. They should be played back first at normal speed and then examined frame-by-frame to give the mothers a clearer idea of incidents about which they might wish to comment.

In the course of the Main Study, it was decided that there would be insufficient time for a thorough investigation of VTRP in the thesis. However, video films were made for this purpose, and it is planned to examine these in a future project.

CHAPTER 4 MAIN STUDY RECRUITMENT OF THE SUBJECTS

After completion of the Pilot Study, it was decided to make a comparison of play between mother and child with three groups of children; autistic (AU Group), developmentally-delayed (DD Group), and non-developmentally-delayed (ND Group). The autistic group was further divided into a higher functioning verbal sub-group (AV) in Study A and a pre-verbal sub-group (APV) in Study B.

The procedure followed for the recruitment of subjects was as follows:

- obtaining ethical approval and establishing contact with appropriate professionals
- selecting children based on descriptive information derived from questionnaires completed by volunteer mothers
- selecting control groups on psychological tests to be matched with the verbal autistic children
- visiting families at home.

1. ETHICAL APPROVAL AND CONTACT WITH APPROPRIATE PROFESSIONALS

Various procedures were followed for the identification of the different groups participating in the study. Ethical approval was sought and received from the Royal Hospital for Sick Children in Glasgow, the Royal Hospital for Sick Children in Edinburgh, the Lothian Region Health Board, the Lothian Department of Education, the Lothian Social Work Department and the Nursery School of the Edinburgh University Department of Psychology.

Regarding the recruitment of the autistic group in Lothian and of the developmentally-delayed children, information was obtained about the child's age, developmental level and medical condition from educational psychologists, clinical psychologists, health visitors and paediatricians prior to distribution of the questionnaires. Additionally,

an advertisement was placed in the journal *Communication* of the National Autistic Society asking for volunteers. Dr Jennifer Wishart from the Department of Psychology approached parents of children with Down's syndrome introducing the research and asking permission for the researcher to contact them. For the non-delayed children, local playgroups and mother and toddler groups were approached asking for volunteers to participate in the study.

Only those who volunteered were approached directly by the researcher. In all other cases the parents were approached by a relevant professional, e.g. clinical or educational psychologist etc, who had taken responsibility for overseeing the study.

The first personal contact between the researcher and the mothers, who had expressed interest in participating, was made with a letter giving information about the study (procedure, number of visits, form of consent required) and asking them to complete a questionnaire, to be called Subject Selection Inventory or SSI (Appendix II.B.1-3). In the letter it was stated that further participation would be decided on the basis of the information in the SSI due to the special requirements of the research. The Subject Selection Inventories and the letters to be sent to the mothers were slightly modified at the request of each Ethical Committee (Appendix II.B.1-3 and II.C.1-4). For example, the question in SSI-II.B.1 'Does the mother have a history of diagnostic psychiatric illness' was changed in SSI-II.B.2 and SSI-II.B.3 to 'Do you have a history of emotional/psychiatric illness'.

2. SUBJECT SELECTION INVENTORIES (SSI)

2.1. Description of Available Instruments for Identification of Autism

Primary information about autistic behaviour is found in clinical observations (Kanner, 1943; Mahler, 1952, 1976; Eisenberg and Kanner, 1956; Wolff and Chess, 1964; Sorosky et al, 1968; Prior and Cajzago, 1974). However, several checklists or questionnaires were published for the diagnosis of autism, or for the discrimination of autism from other developmental disorders, or for the description of autism as a behavioural condition at the time that the current research was

conducted (Table 4.1). Some of these instruments are checklists or questionnaires completed by parents (Form E-2, ABC). Others derive from direct observation of the child (BRIAAC, CARS, BOS) or from interviews with the parents (HBS). In addition, two other checklists were published after this research was conducted (IBSE and CHAT). All these instruments were useful for developing the SSI for the autistic group, but unfortunately they were not adequate for the purposes of the present study (see this Chapter, Table 4.2).

Table 4.1: Summary of Available Instruments for Identification of Autism listed in Chronological Order

	Diagnostic	
Diagnostic Checklist for Behaviour-Disturbed Children	Form E-1	Rimland, 1964
Diagnostic Checklist for Behaviour-Disturbed Children	Form E-2	Rimland, 1971
Behaviour Rating Instrument for Autistic and Atypical Children	BRIAAC	Ruttenberg, Dratman, Frankoi, and Wenar, 1966; Wenar and Ruttenberg, 1976
Children's Handicaps, Behaviour and Skills Schedule	HBS	Wing and Gould, 1978
Autism Behaviour Checklist	ABC	Krug, Arick and Almond, 1980
Childhood Autism Rating Scale	CARS	Schopler, Reichler, DeVillis and Kock, 1980
Behaviour Observation Scale for Autism	BOS	Freeman, Ritvo and Schroth, 1984
Autism Diagnostic Observation Schedule	ADOS	Lord, Rutter, Goode, Heemsbergen, Jordan, Mawhood and Schopler, 1989
	Descriptive	
		Wing, 1969
		Ornitz, Guthrie, Farley, 1977
		Dahlgren and Gillberg, 1989; Gillberg, Ehlers, Schaumann, Jakobsson, Dahlgren, Lindblom, Bågenholm, Tjuus, and Blinder, 1990

The Diagnostic Checklist for Behaviour-Disturbed Children, Form E-1, was first developed in 1964 by Rimland to be answered by parents for children up to seven years old. The checklist aims to diagnose early infantile autism and to differentiate it from other childhood psychoses. It is based on Kanner's description (1943), on studies of childhood schizophrenia, and letters and reports from parents. It consists of 76 questions about the child's birth history, symptoms, speech characteristics and age of onset. The Form E-1 was revised when parents reported that important changes occurred before the age of seven. The Form E-2 was developed (Rimland, 1971) to include questions about the child's development prior to the age of five. Data are collected about social interaction and affect, speech, motor and manipulative skills, intelligence and reaction to sensory stimuli, characteristics of the family, development of any illness, physiological and biological history. A child gains plus points for signs of early infantile autism or minus points for non-autistic behaviours. In the 2218 completed forms, scores ranged from -42 to +45. A score of +20 or higher confirms the diagnosis of early infantile autism.

Ruttenberg and his colleagues invented the Behaviour Rating Instrument for Autistic and Atypical Children or BRIAAC (Ruttenberg et al, 1966). It is another instrument developed for evaluating autistic individuals in the age range 4 to 11 years and evaluating therapeutic effectiveness (Wenar and Ruttenberg, 1976). It stems from a therapeutic programme which is based on the psychoanalytic theory of establishing an 'object relationship'. The main criteria used for selecting autistic children, similar but not identical to Kanner's, are as follows: autistic aloneness, maintenance of sameness, failure to develop language, fascination and preoccupation with objects and a clinical picture of appearing to have higher intellectual abilities than their retarded level. BRIAAC consists of four core scales measuring autistic behaviour in the areas of relationship to an adult as a person, communication, mastery and psychosexual development. In addition, there are three supplementary scales measuring vocalization and speech development, social skills, and motor development and intelligence. Each core scale is subdivided into approximately 10 levels which describe the behaviour

span of a severe autistic child to a normal 6 year old child. The total behaviour of the child is observed and then ten to twenty points are distributed among the levels of each core scale depending on the frequency of the observed behaviour. The scoring of the supplementary scales is based on psychometric tests.

Wing and Gould (1978) constructed the Children's Handicaps, Behaviour and Skills Schedule or HBS for severely retarded or psychotic children. It is a structured interview given by a trained interviewer to parents or professionals caring for the children in the study to obtain information about the child's abilities and behaviour. It consists of two sections, one about developmental skills and another about behavioural abnormalities, with a 3-point rating. Each of the three points gives an indication of absence, presence at a minimal degree and presence at a higher degree.

The Autism Behaviour Checklist or ABC (Krug et al, 1980) was developed to differentiate autistic from severely mentally retarded, deaf-blind, severely emotionally disturbed or normal individuals. It is completed by professionals and weighting scores are assigned to each behaviour descriptor. Its descriptors have been selected from 7 articles including Kanner (1943), Form E-2 of Rimland (1971), Creak (1964) and BRIAAC (Ruttenberg et al, 1966). It consists of 57 behaviour descriptors which have been distributed in 5 symptom areas: sensory, relating, body and object use, language and social. The analysis was based on 1049 completed checklists of individuals ranging from 18 months to 35 years.

Schopler, Reichler, DeVillis and Kock developed the Childhood Autism Rating Scale or CARS (1980) aiming to broaden the classic conceptualization of autism by including Kanner's criteria (1943), the nine diagnostic points of Creak (1964) and the National Autistic Society's definition (1978). The CARS consists of 15 scales, as follows:

impairment in human relationships,

imitation,

inappropriate affect,

bizarre use of body movement and persistence of stereotypes,

peculiarities in relating to non-human objects,

resistance to environmental change,
peculiarities of visual responsiveness,
peculiarities of auditory responsiveness,
near receptor responsiveness,
anxiety reaction,
verbal communication,
non-verbal communication,
activity level,
intellectual functioning, and
general impressions.

There is a range of 7 scores from normal to severe abnormal behaviour for each of the above 15 scales. The rating depends on the child's age and the peculiarity, frequency and intensity of each behaviour. The development of CARS was based on direct observations of the children's behaviour rather than on a theoretical baseline. The test was constructed from an assessment of 537 children, who were divided into three categories: non-autistic, mild to moderate autistic and severe autistic.

The Behaviour Observation Scale for Autism or BOS was completed by Freeman, Ritvo and Schroth in 1984. The aims of BOS are to differentiate autistic from normal and mentally retarded people, to identify subgroups among autistic individuals, and to develop an objective instrument for the description of autism in the fields of behavioural and biological research. It consists of 24 behaviours divided into 4 groups: solitary, relation to objects, relation to people and language. The child is filmed playing on his own with age appropriate toys. The observer reviews the videotape and codes the occurrences of specific behaviours. The data are evaluated with a computer. The BOS was formed on a sample of 137 children. These included autistic children with IQ above 70 (high autistic or HA) matched with normal children, and autistic children with IQ below 70 (low autistic or LA) matched with mentally retarded children. The mean chronological age was 4 to 5 years. Differences were found between HA children and their controls, and

between LA children and their controls. Repetitive solitary behaviours and specific sensory use of objects differentiated HA children and LA children from their controls, but they were more important for the HA group. Both HA and LA children showed less purposeful use of objects and more non-purposeful manipulation. 'Relating to the examiner' was found to be of more importance for the LA children and 'use of language' was more significant for the HA children.

Lord, Rutter, Goode, Heemsbergen, Jordan, Mawhood and Schopler (1989) invented the Autism Diagnostic Observation Schedule or ADOS which is a developmental test rather than a diagnostic rating scale. It focuses on the qualitative expression of communicative and social behaviours. It was intended to standardize observations of communicative and social behaviours of individuals with autism and related disorders, and to form a diagnostic instrument for differentiation of autism from mental handicap and normal development. The examiner's behaviour has to be standardized during the administration of the test which lasts 20-30 minutes. The examiner interacts with the subjects using 8 tasks to elicit certain behaviours. Lord and her colleagues (1989) state that the tasks and their corresponding target behaviours are:

construction task -- asking for help,

unstructured presentation of toys -- symbolic or reciprocal play giving help to the examiner,

drawing games -- taking turns in a structured task,

demonstration of tasks -- descriptive gesture and mime,

poster task -- description of agents and actions,

book task -- telling a sequential story,

conversation -- reciprocal communication, and

socio-emotional questions -- use of language to discuss these topics.

The behaviours are coded during the interview and the score is assigned at the end of the interview. In most cases, the ratings range from 'normal' to 'definitely abnormal'. The ADOS was formed on a sample of 80 subjects from 6 to 18 years: 20 autistic children and adolescents with mild retardation, 20 mentally handicapped children and

adolescents, 20 autistic individuals without mental retardation and 20 normally developing individuals. Unfortunately, this test cannot be used for children having a MA of 3 years or lower. Although inter-rater and test-retest reliability was found for some items, further study is needed.

Further information can be sought in the original articles of the authors or recent reviews of instruments (Parks, 1983, 1988; Morgan, 1988) in which may be found details on topics, such as inter-rater reliability, internal consistency, test-retest reliability, content validity, concurrent validity and discriminant validity.

The first attempt to describe the early development of autistic children was in 1969 by Wing. Behaviours of autistic children were compared with children having congenital receptive aphasia, congenital executive aphasia, congenital partial blindness combined with partial deafness, children with Down's syndrome and normal children. The ages of the children ranged from 4 to 16 years. Parents completed retrospectively a schedule about their child's development from birth until the time of the study. The schedule was divided into 5 main categories: auditory perception and speech, execution of skilled movements, visual perception and related phenomena, social behaviour, non-verbal skills and interests. Each item in each category could be scored as occurring 'always', 'sometimes', 'never', or 'not known'. The parents were also asked to recall at what age the particular behaviour first appeared and then disappeared.

> "The comparison showed that autistic children are multiply handicapped, combining problems of comprehension and use of speech, and right-left, up-down, back-front disorientation similar to those found in the congenital aphasic syndromes, with abnormalities in the use of vision, difficulty in understanding gestures, abnormal bodily movements and preference for the proximal senses as in congenitally partially blind/deaf children." -- (Wing, 1969, p. 21).

Ornitz and his colleagues (1977) created an inventory which was completed by parents retrospectively to provide information about the motor and perceptual development, and the speech and language of

autistic children in their 1st and 2nd years of life. The sample consisted of 74 autistic children matched with 38 normal children having a mean CA of less than 4 years. The effects of parental experience in a retrospective study were considered. Children were matched on chronological age, relation of the parent to the child, and order of birth to avoid confusion with any sibling. The results showed that the autistic children at this early age were delayed in motor and communication skills and, to a minor degree, in perceptual functions.

In another retrospective study (Dahlgren and Gillberg, 1989), a control group of mentally retarded individuals was included. Questionnaires of 130 items were completed by mothers, seeking information about the early development and the typical symptoms of autism. Autistic, mentally retarded and normal individuals were matched on sex, CA and IQ. However, the groups' age at the time of the questionnaire completion ranged from 7 to 22 years which creates problems regarding the reliability of the study because of the time elapsed and the effect of the mother's knowledge that her child is autistic. The aims of the study were to identify symptoms specific to autism, to find underlying causes, and to follow up children to confirm the diagnosis. The results showed that the following 18 items of the 130 discriminated autistic individuals from mentally retarded:

difficulties imitating movements,

strange reactions to sounds,

severe problems over sleep,

play only with hard objects,

bizarre looking at objects,

patterns and movements,

lack of play with other children,

isolation from their surroundings,

dislike of being disturbed in their own world,

suspicion of hearing deficit/deafness,

occupation with self when left alone,

empty gaze,

odd attachments to odd objects,

overexcitement when tickled,

no reaction to cold,

variability of behaviour,

content when alone,

lack of attracting adult's attention,

and lack of smile when expected.

The same questionnaire was used in a prospective study (Gillberg et al, 1990) of 28 suspected autistic children 8 to 35 months. It was found that the crucial characteristics of autistic disorder are abnormalities of play, autistic aloneness, peculiarities of gaze and hearing. "The clinical picture is usually such that a diagnosis can be made on the basis of interview with the mother and observation of the child in the 1-3 year old age range." -- (Gillberg et al, 1990, p. 933).

More recently, questionnaires have been developed to examine behavioural patterns of autistic children in early childhood. The Infant Behavioural Summarized Evaluation (IBSE) (Adrien et al, 1992) was developed to evaluate the severity of behaviour problems for younger children, from 6 to 48 months. It has been used in a pilot version comprising 33 items for assessment of subjects from 6 to 48 months of age. Results with 89 developmentally disabled children, including 39 given a clinical diagnosis of autism, have been published. Statistical analysis demonstrated significant differences between the autistic children and the remainder in scores on a subset of 19 items, including some characteristics typical of the syndrome, such as communicative and social abnormalities, and some less commonly described, e.g. attentional, perceptional and adaptive abnormalities.

The Checklist for Autism in Toddlers (CHAT) (Baron-Cohen et al, 1992) is a scale of nine 'yes'/'no' questions to parents and five observation items to be completed by the health visitor or GP. It was used as a screening test at 18 months to assess 41 children at high genetic risk (approximately 3% risk of family recurrence) of developing autism

and 50 randomly selected control toddlers. Over 80% of controls passed on all items, none failing on more than one of the following:

pretend play,

proto-declarative pointing,

joint-attention,

social interest, and social play.

Four of the high-risk children failed on two or more of these key items. On follow-up at 30 months, all of the children were developing normally with the exception of the four children who had failed two or more items, all of whom received a diagnosis of autism.

2.2. The Subject Selection Inventories (SSIs)

As a preliminary step to selection of optimal diagnostic and comparison groups, questionnaires were developed specially for the study to be completed by the mothers of the various groups. There were three versions of the questionnaire or Subject Selection Inventory (SSI), namely, SSI-AU for autistic subjects (SSI-AV for the verbal autistic subjects and SSI-APV for the pre-verbal autistic subjects), SSI-DD for developmentally-delayed subjects, and SSI-ND for the non-developmentally-delayed subjects (Appendix II.B.1-3). The reasons for creating the questionnaires were as follows:

- practical: to gain sufficient background information about each child and his/her family to ensure identification of the most appropriate candidates in each of the groups, and
- ethical: to avoid visiting families and having to reject them from the study later because the child was found not to be appropriate for the study.

The SSI-AU was completed with the assistance of professionals and was checked by mothers in the Pilot Study (see Chapter 3, Section 2: Subject Selection), as has already been described. Its final version was constructed after the completion of the Pilot Study and it was based on information (Appendix II.A.1) from publications by Kanner (1943), DSM-III-R (1987), Schreibman and Lovaas (1973), National Autistic Society (1978), and from a questionnaire developed by the Child Development

Research Unit in the University of Nottingham for the identification of autistic individuals at schools and hospitals.

The SSI-AU consists of 3 parts including open and closed questions about elements concerning:

- for the child: sex, date of birth, a diagnosis of autism, attendance of educational establishments and treatment programme, physical health, and behaviour of the child
- for the family: number of other children, marital status, ethnographic information, parents' age, nationality, education, occupation, physical and mental health
- for the siblings: physical, mental and developmental condition.

It was slightly modified for the requirements of the Main Study which are summarised as follows:

- subjects would be scattered throughout Britain and were to be in an age range of 3 to 6 years
- subjects were to be identified without personal contact
- subjects were required to form a homogeneous group as regards behavioural characteristics and language
- the children were to be described in sufficient detail to be confirmed as autistic by accepted criteria
- the data on the children and their families were to be based on information at the time that the questionnaire was completed (rather than retrospectively)
- the data on the children and their families were to be based on information at the time that the subjects for the Main Studies were selected
- the children were to be targeted in the preschool years. Information on autism in this age range is minimal, but 2 to 5 years appears to be a crucial period for the development of the disorder. Moreover, it has been reported that the most severe behaviour problems for both handicapped and normal children also appear in this period (Wing, 1969).

Kistner and Robbins (1986) in a review of research on autism over a 12-year span proposed for future research that:

- the diagnostic criteria used by investigators should be clearly delineated
- the procedures for determining if children meet the diagnostic criteria should be described
- the researchers should match autistic and non-autistic groups for mental age, chronological age, and/or some specific characteristic or behaviour in order to draw conclusions that are specific to autism.

The above needs of this study, which was carried out by correspondence, could not be met by using the available instruments. The reasons are summarised briefly in the following table (Table 4.2).

Table 4.2: Summary of the Existing Checklists-Questionnaires listed in Chronological Order which did not Meet the Needs of the Present Study

format of questions is retrospective age range from 3 to 5 years	Rimland, 1971 FORM E-2
children must be observed directly and the Instrument must be completed by a psychoanalytically trained professional	BRIAAC
requires a standard interview with an examiner	HBS
completed by a professional	ABC
children must be observed directly and the scale must be completed by a professional	CARS
children must be observed directly in a natural setting	BOS
requires a standard procedure with an examiner in direct contact with the child	ADOS
covers too large an age span	Wing, 1969
age range 1st and 2nd year (too young)	Ornitz, Guthrie, Farley, 1977
age range from 8 to 35 months (too young)	Dahlgren and Gillberg, 1989; Gillberg, Ehlers, Schaumann, Jakobsson, Dahlgren, Lindblom, Bågenholm, Tjuus and Blinder, 1990

There are certain disadvantages in having the questionnaire completed by the mothers. Sometimes their answers will be ambiguous, because they will choose two ratings for one question, or they will omit answers to questions that they have not understood. These problems, which were encountered in the Pilot Study, were not always overcome in the Main Study by asking the parents to give additional information and to enclose copies of any written reports from professionals who had examined the child. However, parents can be reliable informants about their children's behaviour. They have been found to describe their

children's developmental skills similarly to professionals, but to give a different account of behavioural abnormalities (Wing and Gould, 1978).

The questionnaires for developmentally-delayed (SSI-DD) and non-developmentally-delayed children (SSI-ND) included 3 parts focused mainly on elements concerning:

- for the child: sex, date of birth, attendance of educational establishments, physical health
- for the family: number of other children, marital status, ethnographic information, parents' age, nationality, education, occupation, physical and mental health
- for the siblings: physical, mental and developmental condition.

3. Selecting Children based on Descriptive Information Derived from the Subject Selection Inventory (SSI)

All mothers in all groups gave their consent about the information on the SSIs (Appendix II.D.1-2), except that two mothers in the total autistic group did not give their consent for the section 'family' (this information was excluded from the analysis of the questionnaires and these two children were not included in the Main Study). In the following sections, all the information from the SSI-AU, from the SSI-DD and from the SSI-ND is not reported. For all questionnaires, the section 'child' is described (excluding detailed information) and part of the information in the section 'family'. It has to be emphasized that the results presented are based on the mothers' reports and that sometimes mothers did not answer all questions, so the information is not complete.

In the SSI-AU for the section 'child', there is an extensive part asking questions about the child's behaviour including four areas: 'Communication', 'Relation to People', 'Relation to Objects' and 'General Behaviour'. Some questions can be answered with 'yes' or 'no' and other questions by selecting one measure of a 5-point scale; the 5 points of this scale are 'never', 'seldom', 'occasionally', 'usually' and 'always'. These were reduced into 3 points 'never-seldom', 'occasionally' and 'usually-always' to facilitate the presentation of the results.

First, Tables 4.3, 4.5 and 4.9 show the frequency of each category which characterized the autistic children's behaviour based on information from the SSI-AU, the SSI-AV and the SSI-APV.

Second, Tables 4.4, 4.6 and 4.10 summarise the categories which most frequently characterized the autistic children's impaired development and confirmed their autism. This provides an indication of homogeneity of each group. The criterion used was that a category should be missing 'never-seldom' or be present 'usually-always' in the majority of the children (more than half). Behaviours which 'never-seldom' appeared are listed under 'Impairments In', while behaviours which 'usually-always' appeared are listed under 'Autistic Characteristics'. In cases that a category 'occasionally' characterized the child's behaviour, this is indicated with an asterisk. However, when any of the points gained less than half, the percentage in 'occasionally' was split in half to be added onto 'never-seldom' and 'usually-always'. Thus, a clear picture was formed about which is the most prominent category. Some categories appeared to have the same percentage in all three points of the scale; these categories were not included in the tables but they are reported in the text.

Third, the verbal and the pre-verbal groups are compared with the total autistic group to test whether or not each sub-group is representative of the total population. This comparison is based on the tables which list the most frequent behavioural characteristics of each group as they were classified into 'Impairments In' and into 'Autistic Characteristics' (Tables 4.4, 4.6 and 4.10). Behaviours which were found to be the same in the total autistic group compared with the verbal autistic group (Table 4.7) and compared with the pre-verbal autistic group (Table 4.11) are listed; behaviours which appeared only in one group are reported separately in Tables 4.8 and 4.12.

3.1. AU Group; All Autistic Children

This description is based upon the responses to the SSI-AU completed by the mothers and functioned as a means for the selection of the participants in Studies A and B.

The original population of 40 children consisted of 32 males and 8 females. Their ages ranged from 34 to 77 months and their mean age was 54.42 months (Std. Dev.=12.34). Most were second or first born from a family of two children.

only child	1
first of 2	12
second of 2	18
first to third of 3	5
third to fifth of 4 or 5	4

The ages of the participants when the mother started being upset about their behaviour ranged from 2 to 48 months and their mean age was 17.27 months (Std. Dev.=8.56).

29 children were born with normal delivery and 28 were full-term. From the 29 children born with normal delivery, 7 children were preterm. Of the 28 children who were born full-term, 7 children were not born with normal delivery. 4 children did not have normal delivery and were preterm.

Some children had some kind of illness or handicaps. From the 27 children who had in the past been considered to be deaf, 4 children had a hearing problem at the time of the study, 8 children had an additional handicap or suffered from an illness and 2 were found to have a neurological abnormality (in one case brain pathology as well).

	YES	NO
considered to be deaf	27	13
present hearing problem	4	35
illness or handicaps (other)	10	28
neurological abnormality	2	37
brain pathology	1	34

Regarding school attendance, 17 children attended a nursery school and 16 a primary school, 1 a special school and 1 a special unit.

Although it was reported that 13 of the children were in treatment in different settings, we can assume that more children received different types of treatment as part of their education.

	YES	NO
various kinds of treatment	6	26
speech therapy	4	0
speech and occupational therapy	2	0
holding therapy	1	0

These 13 children received treatment in the following settings:

	YES
at home	4
in educational setting	5
in medical setting	4

37 participants were diagnosed as autistic or as having associated disorders with an age range of 16 to 68 months. The mean age was 39.29 months (Std. Dev.=12.75). About $^2/_3$ of the children had a diagnosis of autism. Their diagnoses are summarised as they were reported by their mothers:

autistic	20
autistic features	5
autistic and autistic features	7
autistic and mentally handicapped	2
autistic, mentally handicapped and deaf	1
autistic and hyperactive	1
autistic features and communication disorder	1
autistic features and Asperger syndrome	1
autistic features and mentally handicapped	1
autistic features and pragmatic syntactic disorder	1

Various people gave the above diagnoses. They were mainly Clinical and Educational Psychologists, Speech Therapists, Paediatricians and Psychiatrists.

Diagnosed by: -	YES	NO
G.P.	3	37
Health Visitor	2	38
Educational Psychologist	12	28
Clinical Psychologist	14	26
Speech Therapist	10	30
Other professional(s)	29	11
Family/Friends	5	35
Other(s)	8	32

Confirmed by: -	YES	NO
G.P.	4	36
Health Visitor	4	36
Educational Psychologist	10	30
Clinical Psychologist	8	32
Speech Therapist	7	33
Other professional(s)	11	29
Family/Friends	4	36
Other(s)	6	34

Mothers answered questions about the way that their children 'communicated', 'related to people', 'related to objects' and 'behaved'. As a group, the children appeared to be specifically impaired in 31 out of the 59 categories which are listed in Table 4.4. Table 4.3 gives the frequencies in each category for the total autistic group, from which Table 4.4 was extracted.

Table 4.3: Results of SSI from the AU Group
Frequency of each Characteristic

	YES	NO	NEVER-SELDOM	OCCASIONALLY	USUALLY-ALWAYS
COMMUNICATION					
problems in receptive language	36	2			
mute	11	29			
spontaneous speech			12	10	7
complete sentences			14	8	8
single words			6	12	12
vocal sounds			5	5	19
names objects, persons			8	6	16
abnormal metaphors			18	2	1
immediate echolalia			7	15	6
delayed echolalia			11	11	5
pronominal reversal			13	5	10
verbal rituals			8	5	15
idiosyncratic utterances			11	4	13
abnormal tone and rhythm in speech			16	5	8
clear articulation and phonation			11	8	10
understands prompts			3	12	15
understands single words			1	7	22
understands spontaneous speech			7	9	12
facial expressions			9	8	13
understands facial expressions			7	9	14
gestures			10	10	10
understands gestures			4	12	14
RELATION TO PEOPLE					
good eye-contact			6	20	14
smiles in social approaches			9	19	12
imitates other people's activity			16	17	6
responds when addressed			7	12	21
anticipates being picked up			7	11	20
cuddly			8	11	21
occupied with parts of the others' body			13	10	17
pushes people away when come too close			10	16	14
bites or pinches other people			24	12	4
notices people coming or leaving			10	12	17
prefers to be alone			4	13	23
initiates communication			10	20	8
relates with the other children			13	22	5
interested in making peer friendships			25	12	3
solitary play rather than cooperative			4	3	32
ritualistic play rather than imaginative			6	5	28
appropriate emotional reactions			9	13	16
seeks comfort when in distress			3	11	24
takes by hand to direct other			7	7	24
RELATION TO OBJECTS					
unusual objects			7	10	22
bizarre treatment of objects			16	8	15
attachment to objects			17	11	12
destructive			23	14	3
GENERAL BEHAVIOUR					
repetitive actions			7	11	24
insistence on sameness			12	11	17
self-stimulation behaviour			4	10	25
overactive to certain sounds or objects			7	15	17
preoccupied with something specific			9	9	21
acts as if deaf			7	20	13
hyperactive rather than apathetic			11	9	20
self-injurious behaviour			30	5	5
temper tantrums			8	19	12
special skills/abilities	18	21			
good rote memory	23	13			
good visual-spatial skills	29	11			
abnormalities in eating	25	15			
abnormalities in sleeping	26	14			

Table 4.4: Behavioural Characteristics of AU Group

IMPAIRMENTS IN	AUTISTIC CHARACTERISTICS
receptive language	vocal sounds
spontaneous speech	immediate echolalia *
complete sentences	verbal rituals
articulation and phonation	idiosyncratic utterances
imitation of other people's activity	occupation with parts of the others' body
initiation of communication *	pushes people away when come too close
relating with the other children *	prefers to be alone
making peer friendships	takes by hand to direct other
cooperative play	unusual use of objects
imaginative play	repetitive actions
	insistence on sameness
	self-stimulation behaviour
	overactive to certain sounds or objects
	preoccupied with something specific
	acts as if deaf
	hyperactive rather than apathetic
	temper tantrums
	good rote memory
	good visual-spatial skills
	abnormalities in eating
	abnormalities in sleeping

In total, 40 questionnaires were returned. On the basis of these, it was decided which families should be approached for participation in the further stages of the Main Study. Mothers with children who were not selected to participate, were informed by letter (Appendix II.C.4). The decisions were made upon the following criteria:

- individual behavioural characteristics confirmed children's autism,
- autistic children as a group formed a homogeneous group
- children's chronological age was in the range 3 to 6 years
- children did not suffer from epilepsy
- children did not have an abnormal EEG
- mothers did not suffer from a psychiatric disorder
- English was the only language spoken in the household, and
- children stayed in regions which made travelling convenient.

3.2. AV Group; Verbal Autistic Children

In all 10 verbal autistic children were visited (Study A) throughout Britain (Figure 4.1: Map of Britain) after examination of the SSI-AU. In one case the mother did not want to continue because of lack of time; in another case, the child was excluded because he was not cooperative at all and did not want to play with his mother. Thus, the verbal autistic group consisted of 8 children. Since it was not possible to find matching controls for one of the 8 children in the verbal autistic group, it was decided to include only 7 autistic children in Study A.

The families of these 7 verbal children were British. English was the only language spoken in the household in every case. No family members suffered from any psychiatric disorder at the time of the study. Their mothers were their natural mothers and their primary caregiver.

None of the autistic children had epileptic features or abnormal EEG. In the verbal autistic group, 5 of the subjects had a diagnosis of 'autism without developmental delay', one had a diagnosis of 'autistic features' and another one of 'autistic features and communication disorder'. According to the parents of these two children, this diagnosis may be due to lack of suitable educational provision and appropriate assessment. All were autistic according to the criteria of Rutter (1978), DSM-III (1980) and DSM-III-R (1987).

Figure 4.1: Map showing the Geographic Location of the Participants in the Main Study

(Green indicates location of the autistic population and Yellow indicates location of the developmentally-delayed and non-delayed population)

The group of 7 verbal autistic children consisted of 5 males and 2 females. The ages of the participants ranged from 52 to 75 months. The mean age was 62 months (Std. Dev.=8.7). Most of the children were second or first born from a family of two children.

only child	1
first of 2	3
second of 2	2
first to third of 3	0
third to fifth of 4 to 5	1

The ages of the participants when the mother started being concerned about their behaviour ranged from 9 to 21 months and their mean age was 14.42 months (Std. Dev.=5.22).

Four children were born with normal delivery but they were preterm. The three children born full-term did not have a normal delivery.

6 children had in the past been considered to be deaf, from whom three children suffered from an illness at the time of the study (one was suffering from permanent cold, another one from asthma and allergy, and the third one from ear infections).

	YES	NO
considered to be deaf	6	1
present hearing problem	0	0
illness or handicaps (other)	3	4
neurological abnormality	0	7
brain pathology	0	7

Regarding school attendance, 4 children attended a nursery school, 1 a primary school, 1 a special school and 1 a special unit. Only the mother of one child was using holding therapy at home. We can assume that children at school received different types of treatment, e.g. speech therapy, occupational therapy.

4 participants were diagnosed as autistic or having associated disorders in the age range from 27 to 47 months with a mean age of 38.75 months (Std. Dev.=9.53).

Various people diagnosed the children. They were mainly Clinical and Educational Psychologists, Speech Therapists, Paediatricians and Psychiatrists.

Diagnosed by: -	YES	NO
G.P.	0	7
Health Visitor	0	7
Educational Psychologist	3	4
Clinical Psychologist	4	3
Speech Therapist	3	4
Other professional(s)	5	2
Family/Friends	1	6
Other(s)	1	6

Confirmed by: -	YES	NO
G.P.	1	6
Health Visitor	2	5
Educational Psychologist	2	5
Clinical Psychologist	2	5
Speech Therapist	2	5
Other professional(s)	3	4
Family/Friends	1	6
Other(s)	1	6

Out of the 59 categories, there were 37 in which the majority of the verbal autistic children had similar characteristics to one another. The categories listed in Table 4.6 frequently characterized their impaired development and confirmed their autism. The information listed in Table 4.6 is based on Table 4.5.

Table 4.5: Results of SSI from the AV Group
Frequency of each Characteristic

	YES	NO	NEVER-SELDOM	OCCASIONALLY	USUALLY-ALWAYS
COMMUNICATION					
problems in receptive language	6	1			
mute	0	7			
spontaneous speech			2	3	0
complete sentences			3	3	1
single words			0	2	5
vocal sounds			2	0	5
names objects, persons			1	2	4
abnormal metaphors			3	2	0
immediate echolalia			1	3	3
delayed echolalia			1	5	1
pronominal reversal			4	0	3
verbal rituals			1	0	6
idiosyncratic utterances			2	1	4
abnormal tone and rhythm in speech			3	1	3
clear articulation and phonation			2	3	2
understands prompts			1	2	4
understands single words			0	1	6
understands spontaneous speech			1	3	3
facial expressions			3	1	3
understands facial expressions			0	5	2
gestures			3	1	3
understands gestures			0	4	3
RELATION TO PEOPLE					
good eye-contact			1	3	3
smiles in social approaches			2	4	1
imitates other people's activity			0	6	1
responds when addressed			0	1	6
anticipates being picked up			1	2	4
cuddly			1	1	5
occupied with parts of the others' body			1	2	4
pushes people away when come too close			1	2	4
bites or pinches other people			5	1	1
notices people coming or leaving			2	2	3
prefers to be alone			1	1	5
initiates communication			2	5	0
relates with the other children			1	4	2
interested in making peer friendships			4	3	0
solitary play rather than cooperative			0	1	6
ritualistic play rather than imaginative			0	0	7
appropriate emotional reactions			1	4	2
seeks comfort when in distress			1	2	4
takes by hand to direct other			1	1	5
RELATION TO OBJECTS					
unusual objects			1	1	5
bizarre treatment of objects			4	2	1
attachment to objects			2	1	4
destructive			4	3	0
GENERAL BEHAVIOUR					
repetitive actions			0	2	5
insistence on sameness			1	2	4
self-stimulation behaviour			0	1	6
overactive to certain sounds or objects			1	1	5
preoccupied with something specific			0	2	5
acts as if deaf			0	6	1
hyperactive rather than apathetic			1	1	5
self-injurious behaviour			5	1	1
temper tantrums			0	4	3
special skills/abilities	4	3			
good rote memory	5	1			
good visual-spatial skills	6	1			
abnormalities in eating	5	2			
abnormalities in sleeping	5	2			

Table 4.6: Behavioural Characteristics of AV Group

IMPAIRMENTS IN	AUTISTIC CHARACTERISTICS
receptive language	vocal sounds
spontaneous speech *	immediate echolalia
complete sentences	delayed echolalia *
understanding facial expressions *	verbal rituals
understanding gestures *	idiosyncratic utterances
smiling in social approaches *	occupation with parts of the others' body
imitation of other people's activity *	pushes people away when come too close
initiation of communication *	prefers to be alone
relating with the other children *	takes by hand to direct other
making peer friendships	unusual use of objects
cooperative play	attachment to objects
imaginative play	repetitive actions
appropriate emotional reactions *	insistence on sameness
	self-stimulation behaviour
	overactive to certain sounds or objects
	preoccupied with something specific
	acts as if deaf *
	hyperactive rather than apathetic
	temper tantrums *
	special skills/abilities
	good rote memory
	good visual-spatial skills
	abnormalities in eating
	abnormalities in sleeping

It was found that 30 categories out of the 37 categories which characterized the verbal autistic group were the same as for the total autistic group (Table 4.7). Only 8 categories (1 category in the total autistic group and 7 categories in the verbal autistic group) differentiated the two groups (Table 4.8).

Table 4.7: Behavioural Characteristics which were the same in AU Group and AV Group

IMPAIRMENTS IN	AUTISTIC CHARACTERISTICS
receptive language	vocal sounds
spontaneous speech	immediate echolalia
complete sentences	verbal rituals
imitation of other people's activity	idiosyncratic utterances
initiation of communication	occupation with parts of the others' body
relating with the other children	pushes people away when come too close
making peer friendships	prefers to be alone
cooperative play	takes by hand to direct other
imaginative play	unusual use of objects
	repetitive actions
	insistence on sameness
	self-stimulation behaviour
	overactive to certain sounds or objects
	preoccupied with something specific
	acts as if deaf
	hyperactive rather than apathetic
	temper tantrums
	good rote memory
	good visual-spatial skills
	abnormalities in eating
	abnormalities in sleeping

Table 4.8: Behavioural Characteristics shown by only One Group

AU Group	AV Group
IMPAIRMENTS IN	IMPAIRMENTS IN
articulation and phonation	understanding facial expressions
	understanding gestures
	smiling in social approaches
	appropriate emotional reactions
	AUTISTIC CHARACTERISTICS
	delayed echolalia
	attachment to objects
	special skills/abilities

3.3. APV Group; Pre-verbal Autistic Children

In all, 7 pre-verbal autistic children were visited (Study B) throughout Britain (Figure 4.1: Map of Britain). One child was excluded because he hardly interacted with his mother at all; he had repetitive behaviours and his mother let him continue without trying to engage him in play. Thus, the pre-verbal autistic group consisted of 6 children.

All families of these 6 pre-verbal autistic children were British and English was the only language spoken in the household. Nobody in the family suffered from a psychiatric disorder at the time of the data collection. Their mothers were their natural mothers and their primary caregiver.

The pre-verbal autistic children did not have epileptic features or abnormal EEGs. All the children were diagnosed autistic and this diagnosis was confirmed using the criteria of Rutter (1978), DSM-III (1980) and DSM-III-R (1987).

All the pre-verbal autistic children were males. The ages of the participants ranged from 34 to 68 months and their mean age was 43.50 months (Std. Dev.=12.58). The majority of the children were second or first born from a family of two children.

first of 2	1
second of 2	3
third to fifth of 3 to 5	2

The mothers started being concerned about their children's behaviour at the period from 2 to 30 months with a mean age of 15 months (Std. Dev.=9.18). Five of the children were born with normal delivery and five were full-term. Only one child was not full-term and he was also not born with normal delivery.

In the pre-verbal group, 4 children had in the past been considered to be deaf, from whom only one had a hearing problem at the time of the data collection (grommets). One child was suffering from asthma.

	YES	NO
considered to be deaf	4	2
present hearing problem	1	5
illness or handicaps (other)	1	5
neurological abnormality	0	6
brain pathology	0	6

Most of the children in the pre-verbal group attended a school; 2 children a nursery school and 2 a primary school.

2 children received medical and educational treatment. One was under homoeopathy and the other one under speech and occupational therapy.

The ages of the participants when they were diagnosed as autistic or having associated disorders ranged from 16 to 68 months. The mean age was 35.16 months (Std. Dev.=18.50). All children were diagnosed as autistic. However, there were two children diagnosed as autistic by some

professionals and having autistic features by others, as their mothers reported.

Various people diagnosed the children, but they were mainly Clinical Psychologists, Speech Therapists, Paediatricians and Psychiatrists.

Diagnosed by: -	YES	NO
G.P.	0	6
Health Visitor	1	5
Educational Psychologist	0	6
Clinical Psychologist	2	4
Speech Therapist	2	4
Other professional(s)	4	2
Family/Friends	1	5
Other(s)	1	5

Confirmed by: -	YES	NO
G.P.	0	6
Health Visitor	0	6
Educational Psychologist	0	6
Clinical Psychologist	0	6
Speech Therapist	0	6
Other professional(s)	2	4
Family/Friends	0	6
Other(s)	0	6

Out of the 59 categories, there were 35 in which the majority of the pre-verbal autistic children had similar characteristics to one another. Out of the 6 children, 3 were mute and the mothers of these three children were not asked to complete the 'Communication' section. The categories listed in Table 4.10 frequently characterized the pre-verbal autistic children's impaired development and confirmed their autism. There were some categories for which the same percentages appeared in the three points of the scale. These categories are: impairments in expressive language, in anticipating when picked up, in noticing people coming or leaving, and autistic characteristics such as bizarre treatment of objects and insistence on sameness. The information in Table 4.10 derives from Table 4.9.

Table 4.9: Results of SSI from the APV Group
Frequency of each Characteristic

	YES	NO	NEVER-SELDOM	OCCASIONALLY	USUALLY-ALWAYS
COMMUNICATION					
problems in receptive language	6	0			
mute	3	3			
spontaneous speech			3	0	0
complete sentences			3	0	0
single words			0	2	1
vocal sounds			0	0	3
names objects, persons			2	0	1
abnormal metaphors			2	0	1
immediate echolalia			1	2	0
delayed echolalia			3	0	0
pronominal reversal			2	1	0
verbal rituals			2	1	0
idiosyncratic utterances			3	0	0
abnormal tone and rhythm in speech			2	0	1
clear articulation and phonation			1	1	0
understands prompts			1	1	1
understands single words			0	2	1
understands spontaneous speech			2	0	1
facial expressions			0	1	2
understands facial expressions			2	1	0
gestures			2	1	0
understands gestures			2	0	1
RELATION TO PEOPLE					
good eye-contact			0	4	2
smiles in social approaches			2	3	1
imitates other people's activity			5	1	0
responds when addressed			1	4	1
anticipates being picked up			2	2	2
cuddly			0	2	4
occupied with parts of the others' body			2	1	3
pushes people away when come too close			1	3	2
bites or pinches other people			5	1	0
notices people coming or leaving			2	2	2
prefers to be alone			0	1	5
initiates communication			5	1	0
relates with the other children			4	2	0
interested in making peer friendships			6	0	0
solitary play rather than cooperative			1	0	5
ritualistic play rather than imaginative			1	0	5
appropriate emotional reactions			1	2	3
seeks comfort when in distress			0	2	4
takes by hand to direct other			0	2	4
RELATION TO OBJECTS					
unusual objects			1	2	3
bizarre treatment of objects			2	2	2
attachment to objects			3	2	1
destructive			3	2	1
GENERAL BEHAVIOUR					
repetitive actions			1	1	4
insistence on sameness			2	2	2
self-stimulation behaviour			1	1	4
overactive to certain sounds or objects			0	4	2
preoccupied with something specific			2	1	3
acts as if deaf			0	3	3
hyperactive rather than apathetic			2	1	3
self-injurious behaviour			4	1	1
temper tantrums			1	3	2
special skills/abilities	2	4			
good rote memory	3	3			
good visual-spatial skills	3	3			
abnormalities in eating	4	2			
abnormalities in sleeping	4	2			

Table 4.10: Behavioural Characteristics of APV Group

IMPAIRMENTS IN	AUTISTIC CHARACTERISTICS
receptive language	vocal sounds
spontaneous speech	immediate echolalia *
complete sentences	occupation with parts of the others' body
single words *	pushes people away when come too close
naming objects, persons	prefers to be alone
understanding single words *	takes by hand to direct other
understanding spontaneous speech	unusual use of objects
understanding facial expressions	repetitive actions
gestures	self-stimulation behaviour
understanding gestures	overactive to certain sounds or objects *
eye-contact *	preoccupied with something specific
smiling in social approaches	acts as if deaf
imitation of other people's activity	hyperactive rather than apathetic
responding when addressed *	temper tantrums
initiation of communication	abnormalities in eating
relating with the other children	abnormalities in sleeping
making peer friendships	
cooperative play	
imaginative play	

It was found that 28 categories out of the 35 which characterized the pre-verbal autistic group were the same for the total group (Table 4.11). 16 categories (6 categories characterized only the total autistic group and 10 characterized only the pre-verbal autistic group) differentiated the two groups (Table 4.12).

Table 4.11: Behavioural Characteristics which were the same in AU Group and APV Group

IMPAIRMENTS IN	AUTISTIC CHARACTERISTICS
receptive language	vocal sounds
spontaneous speech	immediate echolalia
complete sentences	occupation with parts of the others' body
eye-contact	pushes people away when come too close
smiling in social approaches	prefers to be alone
imitation of other people's activity	takes by hand to direct other
initiation of communication	unusual use of objects
relating with the other children	repetitive actions
making peer friendships	insistence on sameness
cooperative play	self-stimulation behaviour
imaginative play	overactive to certain sounds or objects
	preoccupied with something specific
	acts as if deaf
	hyperactive rather than apathetic
	temper tantrums
	abnormalities in eating
	abnormalities in sleeping

Table 4.12: Behavioural Characteristics shown by only One Group

AU Group	APV Group
IMPAIRMENTS IN	IMPAIRMENTS IN
articulation and phonation	single words
	naming objects, persons
	understanding single words
	understanding spontaneous speech
	understanding facial expressions
	gestures
	understanding gestures
	eye contact
	smiling in social approaches
	responding when addressed
AUTISTIC CHARACTERISTICS	
verbal rituals	
idiosyncratic utterances	
insistence on sameness	
good rote memory	
good visual-spatial skills	

3.4. Conclusions about the Subject Selection Inventory (SSI) in the Autistic Groups

The analysis of the SSI for the total autistic group, the verbal and the pre-verbal groups, which were to participate in the Main Study, aimed to describe group characteristics for the confirmation of a diagnosis for autism, to test the homogeneity of each group and the degree that the verbal and the pre-verbal groups are representative of the total autistic groups. The verbal and pre-verbal autistic groups were not compared because this was not the primary interest of the investigation and by definition the two groups were different. It can be easily observed that the pre-verbal children are more impaired in linguistic categories compared to the verbal group (e.g. impairment in single words, naming objects, understanding spontaneous speech etc) and in intellectual

abilities (e.g. rote memory, visual-spatial skills etc). However, both groups have a very similar behavioural profile. The results have shown that:

- The children are confirmed to be autistic. In all groups, the children yielded high frequencies in the majority of the categories which are indicative of autistic behaviour according to the literature; the number of the most frequent categories was 31 for the total autistic group, 37 for the verbal autistic group and 35 for the pre-verbal autistic group out of the 59 categories.
- The children in the sub-groups form homogeneous groups. The individuals in the verbal and the pre-verbal autistic group have similar characteristics in the majority of the categories, so that homogeneous groups are established. There were 37 categories in the verbal autistic group and 35 in the pre-verbal autistic group which appeared very frequently to characterise children's behaviour.
- The verbal autistic and the pre-verbal autistic groups are representative of the total population of autistic children whose mothers volunteered to participate in the study. There were 30 categories, out of 37, which characterized both the verbal autistic group and the total autistic group. For the pre-verbal autistic group, 28 out of the 35 categories, were identical with the total group. In the pre-verbal autistic group, 16 categories were found to be different from the total autistic group (10 are attributed to differences in 'Communication' -- 3 in the total autistic group and 7 in the pre-verbal group). This is because the mothers were not asked to complete the part 'Communication' when their children did not have any language, and because by definition the pre-verbal autistic group was not expected to have high language abilities.

3.5. DD Group; Developmentally-delayed Children

20 questionnaires were received from mothers with developmentally-delayed children, 3 to 8 years old, who were willing to participate in Study A. It was decided on the basis of the information in the questionnaires to visit the families of 9 children with developmental delay. However, after administration of the psychological tests only 7

were appropriate matching controls for the verbal autistic group. Thus, the developmentally-delayed group consisted of 5 children with Down's syndrome (DS) and 2 children with developmental delay of unspecified origin (DDU). Some information from the SSI-DD is presented.

None of the children had autistic features. This group consisted of 5 males and 2 females. The ages of the participants ranged from 48 to 75 months. The mean age was 61.5 months (Std. Dev.=12.1).

Their families were British and English was the only language spoken in the household in every case. No family members suffered from any psychiatric disorder. Their mothers were their natural mothers and their primary caregiver.

The birth order of the children varied. 6 children were born with normal delivery and 4 were full-term. 3 out of the 6 children born with normal delivery were not full-term.

first of 2	2
second of 2	2
first to third of 1-3	1
third to fifth of 3-5	2

The 2 children with developmental delay of unspecified origin had motor and health problems; one had a speech problem as well. In the group of the 5 children with Down's syndrome, 3 had a hearing problem, 3 had a sight problem, all had a speech problem, 2 had a motor problem and 3 other health problems.

	YES	NO
hearing problem	3	4
sight problem	3	4
speech problem	6	1
motor problem	4	3
epilepsy	0	7
heart problems	4	3
other health problems (haemophilia)	1	6
neurological abnormality (including brain pathology)	0	7
genetic/chromosomal abnormality	5	2

All children were receiving school education; 2 children attended a nursery school, 4 a primary school for children with learning difficulties and 1 a nursery and a primary school. 6 children were seeing professional people (2 Speech Therapists, 2 Developmental and 2 Medical) for treatment of their handicap. Only 3 mothers received professional guidance (1 from School Teachers, 1 from a Home Visiting Teacher and 1 from an Educational Psychologist and a Paediatrician) for coping with their children's developmental delay.

3.6. ND Group; Non-developmentally-delayed Children

40 questionnaires were received from mothers with non-delayed children, $1\frac{1}{2}$ to 5 years old, who were willing to participate in Study A. In all, 11 families were visited after examination of the information in the questionnaires. However, after administration of the psychological tests only 7 were appropriate matching controls for the verbal autistic group. Thus, the non-delayed group consisted of 7 children and information from the SSI-ND is presented.

The group of non-delayed children consisted of 5 males and 2 females. The ages of the participants ranged from 21 to 33 months with a mean age of 26.8 months (Std. Dev.=4.7).

Their families were British and English was the only language spoken in the household in every case. No family members suffered from any psychiatric disorder at the time of the study. Their mothers were their natural mothers and their primary caregiver.

Most of the children were second born from a family of two children (2 had no siblings, 4 were second born from a family of 2 children and 1 was third born from a family of 3 children).

The children had average ability with no conspicuous problems according to the information in the questionnaires. None of these children had hearing, sight, speech or health problems. Regarding preschool education, 5 attended a local playgroup.

4. SELECTING COMPARISON GROUPS ON PSYCHOLOGICAL TESTS

4.1. Description of Psychological Tests

Psychological tests were used in this study to obtain further information about the intellectual functioning of the children and to provide a basis for matching the 3 groups in Study A. It is accepted that the profile derived from the testing may not represent the full potential of the children's abilities.

The tests chosen, the Vineland Adaptive Behaviour Scales, the Leiter International Performance Scale and the Reynell Developmental Language Scales were considered most appropriate for the developmental and chronological age range of the subjects and for matching the participant groups. These tests are capable of distinguishing children according to their verbal and non-verbal abilities. The original aim of the study was to match verbal autistic children with developmentally-delayed both on non-verbal ability (Leiter) and verbal ability (Reynell). However, this proved to be impossible after testing of some developmentally-delayed children, who seemed to have problems with the completion of the tasks due to their deficiency in fine motor skills. It was then decided to match comparison groups on verbal ability only, which is nevertheless the most appropriate way of equating children (see Chapter 2, Section 3.2: Criticism of Empirical Studies, and below).

Vineland Adaptive Behaviour Scales

The Survey Form of the Vineland Adaptive Behaviour Scales (Sparrow et al, 1984) proved suitable for two reasons. First, as a structured interview, it gave the researcher a chance to familiarise herself with the mother and the child, for all groups. Second, it provided information on the low functioning autistic children with whom no other test could be administered. Thus, scores could be obtained that were comparable across all groups.

The Survey Form of the Vineland is a tool used for classification of behaviours and diagnosis that measures adaptive behaviour by means

of an interview with the mother, in the domains of Communication, Daily Living Skills, Socialization, Motor Skills and Maladaptive Behaviour, for the age range from birth through 18 years and for delayed and non-delayed individuals. It has been used to assess adaptive behaviour differences between a group of autistic and developmentally-delayed children and the results indicated that these Scales can be an instrument for discriminating these two groups mainly in the Communication and Socialization domains (Volkmar et al, 1987).

Leiter International Performance Scale

The Leiter International Performance Scale (Leiter, 1980) was used because the children in the autistic group came from all over Britain. The researcher could not obtain information about the children's level of intellectual functioning (such as psychiatrists' or clinical psychologists' reports) and a test that gave opportunities for all children in the autistic group to respond was required. No test of general intelligence could be used as some tests are limited by the age range covered, and others by the autistic child's limited understanding of speech.

In comparison with other tests, the Leiter is preferable to the Merill-Palmer because it covers a wider range in years (Leiter: 2 to 18 years , Merill-Palmer $1\frac{1}{2}$ to $5\frac{1}{4}$ years), an IQ is obtained and the tasks are not timed. Furthermore, 'bright' autistic children can reach a ceiling level with the Merill-Palmer. The Stanford-Binet was not chosen because it relies on language abilities to obtain an indication of the child's developmental level, and an autistic child's score is likely to be biased by language impairment.

The Leiter, which measures non-verbal ability rather than general intellectual ability (Shah and Holmes, 1985), includes perceptual and visuo-spatial items on which some autistic children can perform remarkably well (DeMyer, 1976; Lockyer and Rutter, 1970). Consequently, if Leiter scores were relied upon, autistic, developmentally-delayed and non-delayed children could be mismatched. For this reason, groups were matched on a more critical measure of the intellectual impairment seen in autistic children, i.e. the language impairment. However, the Leiter

was still useful in the Main Study for obtaining a measure additional to the verbal ability measure for verbal and pre-verbal autistic children.

The Leiter requires neither comprehension nor expression of language, and its items are not timed. Thus, it is appropriate for those autistic children who have been called 'untestable' (Alpern, 1967); those who have severe problems in language and who possibly do not understand the meaning of speed in a test and who, therefore, lack the motivation and concentration to respond to timed tests. Although the Leiter is a non-verbal test, the attentional demands are considerable and its tasks, beginning as simple matching tasks, become gradually more conceptual. From correlations with the Stanford-Binet, the WISC and the WISC-R, the Leiter appears to have a satisfactory validity for non-delayed and developmentally-delayed children and it is considered to be a good indicator of non-verbal ability (Shah and Holmes, 1985). However, some autistic children can do well in this test, given that they show a wide variation in ability in perceptual and visuo-spatial tasks (Lockyer and Rutter, 1970; DeMyer, 1976). It is recommended that the Leiter be used for diagnosis and in conjunction with other tests. It is held not to measure general intelligence (Gould, 1975).

Reynell Developmental Language Scales

The Reynell Developmental Language Scales Second Revision (Reynell and Huntley, 1985) assesses verbal comprehension or receptive abilities and, in the expressive language section, assesses the content, vocabulary and structure of the child's verbal output. It conveys information on most of the functions of language, and can be used with very young children, 1 to 7 years old. In studies by Sigman and Ungerer (1984a), and Mundy, Sigman, Ungerer and Sherman (1987) complex receptive and expressive language abilities were found to correlate with symbolic play in autism. Other language tests, such as the British Picture Vocabulary Scales (BPVS) or British Ability Scales (BAS), would be inappropriate for administration to very young autistic children because the starting performance level required is quite high.

A study by Lewis and Boucher (1988) was intended to clarify findings concerning the spontaneous play of autistic children with

conceptual-linguistic development well above the minimum level at which symbolic play normally occurs, and to test a hypothesis about the possible cause of impairments in spontaneous play. They advocate the Renfrew Action Picture Test, rather than the BPVS used by Baron-Cohen (1987) in a study of symbolic play as a test for matching comparison groups, because the vocabulary of the autistic children is usually more advanced than their acquisition of grammar. Matching autistic children and control groups on a vocabulary test, such as the BPVS, therefore entails mismatching them for more complex language skills. When attempting to assess autistic children's symbolic play it is more appropriate to equate experimental and control groups on a test of complex language. The Renfrew assesses children's abilities to understand what is happening in pictures and to convey this by answering questions. It yields two scores: one for the informational content and one for the grammaticality of the child's replies. There is evidence that tests of language comprehension, like the Peabody Picture Vocabulary Test (PPVT) and the Test for Auditory Comprehension of Language (TACL) are not sufficient (Tsai and Beisler, 1984). Therefore, the Reynell was used which is similar to the Renfrew test, measuring not only receptive vocabulary but language content as well (e.g. connecting many ideas in a sentence).

4.2. Tests and Matching Groups in Study A

This study describes how play and dyadic communication is organized between mothers and preschool verbal autistic children (AV), and defines any differences in comparisons with the play and dyadic communication of mothers with developmentally-delayed (DD) and non-developmentally-delayed children (ND). Each of the three groups is composed of 7 children matched on language (Reynell), sex and mother's level of education. Additionally, autistic and developmentally-delayed children are matched for chronological age[1] (Table 4.13). Information about other psychological tests and details on mother's education can be

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[1] Although there is evidence that studies of the autistic populations should control for chronological age and sex (Rutter, 1978; Tsai and Beisler, 1984), there is no data on how closely the ages of the groups should be matched, e.g. within 2 or 8 months (Tsai and Beisler, 1984).

found in Table 4.15, Table 4.16, Table 4.17 and Table 4.18. Table 4.14 lists full names of abbreviated codes.

The autistic and delayed groups were selected so that the individuals in the two groups would be as similar as possible in chronological age, in verbal and non-verbal mental age and in mother's level of education. It was only possible to match four of the children individually and, therefore, the rest were matched as a group.

The selection of the autistic and the non-delayed groups was carried out so that the members of the autistic group would have a chronological age equal to or higher than that of the non-delayed group. The non-delayed group could not be matched exactly with the autistic or delayed group on chronological age because of the discrepancy between measures of verbal and non-verbal mental age.

Any differences between autistic, delayed and non-delayed children can be attributed neither to mental retardation, (since the mental age of the developmentally-delayed group is comparable to that of the autistic group), nor to chronological age (since the non-delayed group is younger than the autistic group).

Table 4.13: Characteristics of Each Matched Group in Study A

N=7	CA	VERBAL COMPREHENSION	EXPRESSIVE VOCABULARY	MOTHER'S EDUCATION
(M=5 F=2)	in months	Reynell Language Scales in months		in years
		AUTISTIC VERBAL		
MEAN	62	26.5	27	14.4
STD. DEV.	8.7	6.3	8.7	2.1
RANGE	52-75	15-34	17-40	11-17
		DEVELOPMENTALLY-DELAYED		
MEAN	61.5	28.7	27.7	13
STD. DEV.	12.1	5.4	8.1	2.8
RANGE	48-75	19-36	19-44	10-16
		NON-DEVELOPMENTALLY-DELAYED		
MEAN	26.8	26.1	25.2	14
STD. DEV.	4.7	6	3.4	2.4
RANGE	21-33	17-34	21-31	11-17

Table 4.14: Index of Abbreviations

AV	CHILDREN WITH AUTISM HAVING VERBAL ABILITIES (VERBAL)
APV	CHILDREN WITH AUTISM FUNCTIONING AT A PRE-VERBAL LEVEL OF DEVELOPMENT (PRE-VERBAL)
DDU / DS	CHILDREN WITH DEVELOPMENTAL DELAY OF UNSPECIFIED ORIGIN / CHILDREN WITH DOWN'S SYNDROME
DD	CHILDREN WITH DEVELOPMENTAL DELAY
ND	CHILDREN WITHOUT DEVELOPMENTAL DELAY
DIA	DIAGNOSIS
INIT	INITIALS OF CHILDREN'S NAMES
SEX	SEX OF CHILDREN
M	CHILD IS MALE
F	CHILD IS FEMALE
CA	CHRONOLOGICAL AGE AT THE TIME OF ADMINISTRATION OF THE TESTS
L MA	MENTAL AGE ON THE LEITER INTERNATIONAL PERFORMANCE SCALE
L IQ	IQ SCORE ON THE LEITER INTERNATIONAL PERFORMANCE SCALE
R VC	VERBAL COMPREHENSION ON THE REYNELL DEVELOPMENTAL LANGUAGE SCALES 2ND REVISION IN MONTHS
R EV	EXPRESSIVE VOCABULARY ON THE REYNELL DEVELOPMENTAL LANGUAGE SCALES 2ND REVISION IN MONTHS
V COM	COMMUNICATION DOMAIN ON THE VINELAND ADAPTIVE BEHAVIOUR SCALES IN MONTHS
V DLS	DAILY LIVING SKILLS DOMAIN ON THE VINELAND ADAPTIVE BEHAVIOUR SCALES IN MONTHS
V SOC	SOCIALIZATION DOMAIN ON THE VINELAND ADAPTIVE BEHAVIOUR SCALES IN MONTHS
V ABC	ADAPTIVE BEHAVIOUR COMPOSITE ON THE VINELAND ADAPTIVE BEHAVIOUR SCALES IN MONTHS
MYS	MOTHER AT SCHOOL IN YEARS
MFE	MOTHER'S FURTHER EDUCATION IN YEARS
MTE	MOTHER'S TOTAL EDUCATION IN YEARS
SC / unsp.	SOCIAL CLASS / SOCIAL CLASS COULD NOT BE CLASSIFIED
0 / -	THE TEST WAS ADMINISTERED BUT THE CHILD FAILED TO OBTAIN A SCORE / THE TEST WAS NOT ADMINISTERED

Table 4.15: Individual Characteristics per Matched Group of Participants in Study A

				LEITER		REYNELL		VINELAND				MOTHERS' EDUCATION			
DIA	**INIT**	**SEX**	**CA**	**L MA**	**L IQ**	**R VC**	**R EV**	**V COM**	**V DLS**	**V SOC**	**V ABC**	**MYS**	**MFE**	**MTE**	**SC**
AV	CS	M	52	53	103	34	38	35	38	45	39	13	2	15	III
DDU	RD	M	74	61	82	33	31	39	33	30	34	11	0	11	III
ND	LC	M	33	-	-	34	27	44	28	30	34	11	0	11	II
AV	SI	M	55	50	92	30	27	25	31	36	30	11	4	15	II
DS	GW	M	53	0	0	25	24	18	19	25	20	12	4	16	II
ND	RB	M	30	-	-	30	27	43	41	39	41	12	0	12	II
AV	MS	M	58	36	62	15	24	23	30	35	29	13	4	17	II
DS	MH	M	48	0	0	19	19	19	24	20	21	11	0	11	III
ND	CM	M	21	-	-	17	24	25	20	15	20	12	5	17	II
AV	TF	M	59	60	102	25	17	22	35	34	30	12	4	16	III
DS	SB	M	48	0	0	29	22	22	28	28	26	12	4	16	II
ND	BR	M	25	-	-	23	25	30	24	27	27	12	5	17	III
AV	LN	F	62	36	58	26	20	22	43	29	31	12	0	12	II
DS	LM	F	61	39	64	30	28	31	54	59	48	10	0	10	unsp.
ND	LW	F	24	-	-	23	22	28	35	50	37	12	3	15	I
AV	SD	F	73	55	75	32	40	39	26	45	37	11	0	11	III
DDU	MW	F	72	54	76	36	44	38	21	46	35	11	0	11	III
ND	RM	F	32	-	-	32	31	40	38	28	35	13	1	14	III
AV	DP	M	75	40	53	24	23	33	39	46	39	15	0	15	III
DS	SR	M	75	0	0	29	26	37	52	57	48	12	4	16	II
ND	SG	M	23	-	-	24	21	19	17	18	18	12	0	12	II

Table 4.16: Individual Characteristics per Diagnostic Group of Participants in Study A

DIA	AV	AV	AV	AV	AV	AV	AV	DDU	DS	DS	DS	DS	DDU	DS	ND	ND	ND	ND	ND	ND	ND
INIT	CS	SI	MS	TF	LN	SD	DP	RD	GW	MH	SB	LM	MW	SR	LC	RB	CM	BR	LW	RM	SG
SEX	M	M	M	M	F	F	M	M	M	M	M	F	F	M	M	M	M	M	F	F	M
CA	52	55	58	59	62	73	75	74	53	48	48	61	72	75	33	30	21	25	24	32	23
L MA	53	50	36	60	36	55	40	61	0	0	0	39	54	0	-	-	-	-	-	-	-
L IQ	103	92	62	102	58	75	53	82	0	0	0	64	76	0	-	-	-	-	-	-	-
R VC	34	30	15	25	26	32	24	33	25	19	29	30	36	29	34	30	17	23	23	32	24
R EV	38	27	24	17	20	40	23	31	24	19	22	28	44	26	27	27	24	25	22	31	21
V COM	35	25	23	22	22	39	33	39	18	19	22	31	38	37	44	43	25	30	28	40	19
V DLS	38	31	30	35	43	26	39	33	19	24	28	54	21	52	28	41	20	24	35	38	17
V SOC	45	36	35	34	29	45	46	30	25	20	28	59	46	57	30	39	15	27	50	28	18
V ABC	39	30	29	30	31	37	39	34	20	21	26	48	35	48	34	41	20	27	37	35	18
MYS	13	11	13	12	12	11	15	11	12	11	12	10	11	12	11	12	12	12	12	13	12
MFE	2	4	4	4	0	0	0	0	4	0	4	0	0	4	0	0	5	5	3	1	0
MTE	15	15	17	16	12	11	15	11	16	11	16	10	11	16	11	12	17	17	15	14	12
SC	III	II	II	III	II	III	III	III	II	III	II	unsp.	III	II	II	II	II	III	I	III	II

Table 4.17: Characteristics of Participants per Psychological Test in Study A

N=7	MEAN	STD. DEV.	RANGE
Leiter MA			
AV	47.1	9.7	36-60
DD	22	28.1	0-61
ND	-	-	-
Leiter IQ			
AV	77.8	21.1	53-103
DD	31.7	39.9	0-82
ND	-	-	-
Vineland COMMUNICATION			
AV	28.4	7	22-39
DD	29.1	9.2	18-39
ND	32.7	9.6	19-44
Vineland DAILY LIVING SKILLS			
AV	34.5	5.9	26-43
DD	33	14.4	19-54
ND	29	9.2	17-41
Vineland SOCIALIZATION			
AV	38.5	6.7	29-46
DD	37.8	15.9	20-59
ND	29.5	11.9	15-50
Vineland ADAPTIVE BEHAVIOUR COMPOSITE			
AV	33.5	4.5	29-39
DD	33.1	11.6	20-48
ND	30.2	8.7	18-41
MOTHER AT SCHOOL IN YEARS			
AV	12.4	1.3	11-15
DD	11.2	0.7	10-12
ND	12	0.5	11-13
MOTHER'S FURTHER EDUCATION IN YEARS			
AV	2	2	0-4
DD	1.7	2.1	0-4
ND	2	2.3	0-5

SOCIAL CLASS				
	I	**II**	**III**	**unsp.**
AV	-	3	4	-
DD	-	3	3	1
ND	1	4	2	-

Table 4.18: Characteristics per Diagnostic Group of Participants in Study A

N=7	MEAN	STD. DEV.	RANGE
AV			
Leiter MA	47.1	9.7	36-60
Leiter IQ	77.8	21.1	53-103
Vineland COMMUNICATION	28.4	7	22-39
Vineland DAILY LIVING SKILLS	34.5	5.9	26-43
Vineland SOCIALIZATION	38.5	6.7	29-46
Vineland ADAPTIVE BEHAVIOUR	33.5	4.5	29-39
MOTHER at school in years	12.4	1.3	11-15
MOTHER's further education in years	2	2	0-4
SOCIAL CLASS			
I	1		
II	2		
II	3		
unsp.	-		
DD			
Leiter MA	22	28.1	0-61
Leiter IQ	31.7	39.9	0-82
Vineland COMMUNICATION	29.1	9.2	18-39
Vineland DAILY LIVING SKILLS	33	14.4	19-54
Vineland SOCIALIZATION	37.8	15.9	20-59
Vineland ADAPTIVE BEHAVIOUR	33.1	11.6	20-48
MOTHER at school in years	11.2	0.7	10-12
MOTHER's further education in years	1.7	2.1	0-4
SOCIAL CLASS			
I	-		
II	3		
II	3		
unsp.	1		
ND			
Leiter MA	-	-	-
Leiter IQ	-	-	-
Vineland COMMUNICATION	32.7	9.6	19-44
Vineland DAILY LIVING SKILLS	29	9.2	17-41
Vineland SOCIALIZATION	29.5	11.9	15-50
Vineland ADAPTIVE BEHAVIOUR	30.2	8.7	18-41
MOTHER at school in years	12	0.5	11-13
MOTHER's further education in years	2	2.3	0-5
SOCIAL CLASS			
I	1		
II	4		
II	2		
unsp.	-		

4.3. Tests and Composition of Groups in Study B

As has already been mentioned, autistic children were selected on the basis of the information in the SSI-AU. After the first few visits to the families of the autistic children, it was revealed that the pattern of play and communication between pre-verbal autistic children and their mothers was different from the verbal autistic group. Thus, it was decided to create a second separate group to include the pre-verbal autistic children. This was considered to be fruitful for two reasons; first, to extend our information of the findings in Study A and second, to compare verbal and pre-verbal groups because the play and communication in subgroups of autistic children is a field of study so far neglected (see Chapter 2, Section 6: Development of Play and Communication in Low Functioning Children with Autism).

The AV group is the group participating in Study A. Verbal and pre-verbal autistic children were not matched. The aim of the study was to compare autistic children with different cognitive and verbal abilities. The mean chronological age of the APV group was approximately 1 year younger than the AV group. All pre-verbal children failed to obtain a score in the Reynell higher than the level of 1 year and only two children were 'testable' on the Leiter. The mean age of functioning in the pre-verbal group for the domains of Vineland was approximately one year lower in comparison with the verbal group. Further information about the administration of psychological tests with the pre-verbal group and details on mother's education can be found in Tables 4.19-4.21.

Table 4.19: Individual Characteristics per Diagnostic Group of Participants in Study B

DIAGNOSIS	AV	AV	AV	AV	AV	AV	AV	APV	APV	APV	APV	APV	APV
INITIALS	CS	SI	MS	TF	LN	SD	DP	LF	RB	AF	MD	TS	CD
SEX	M	M	M	M	F	F	M	M	M	M	M	M	M
CHRONOLOGICAL AGE	52	55	58	59	62	73	75	40	42	47	47	49	69
Leiter MENTAL AGE	53	50	36	60	36	55	40	41	0	0	0	29	0
Leiter IQ	103	92	62	102	58	75	53	103	0	0	0	60	0
Reynell VERBAL COMPREHENSION	34	30	15	25	26	32	24	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Reynell EXPRESSIVE VOCABULARY	38	27	24	17	20	40	23	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Vineland COMMUNICATION	35	25	23	22	22	39	33	17	10	10	2	13	19
Vineland DAILY LIVING SKILLS	38	31	30	35	43	26	39	18	12	12	10	18	28
Vineland SOCIALIZATION	45	36	35	34	29	45	46	35	8	10	6	21	11
Vineland ADAPTIVE BEHAVIOUR	39	30	29	30	31	37	39	23	10	11	6	17	19
MOTHER at school in years	13	11	13	12	12	11	15	10	12	10	11	11	11
MOTHER's further education in years	2	4	4	4	0	0	0	0	0	0	0	0	0
MOTHER's total education	15	15	17	16	12	11	15	10	12	10	11	11	11
SOCIAL CLASS	III	II	II	III	II	III	III	III	II	III	II	II	II

Table 4.20: Characteristics of Participants per Psychological Test in Study B

AV N=7 / APV N=6	MEAN	STD. DEV.	RANGE
Chronological Age			
AV	62	8.7	52-75
APV	49	10.3	40-69
Reynell Verbal Comprehension			
AV	26.5	6.3	15-34
APV	functioning at a level younger than 1 year old		
Reynell Expressive Vocabulary			
AV	27	8.7	17-40
APV	functioning at a level younger than 1 year old		
Leiter MA			
AV	47.1	9.7	36-60
APV	11.6	18.4	0-41
Leiter IQ			
AV	77.8	21.1	53-103
APV	27.1	44.2	0-103
Vineland COMMUNICATION			
AV	28.4	7	22-39
APV	11.8	6	2-19
Vineland DAILY LIVING SKILLS			
AV	34.5	5.9	26-43
APV	16.3	6.6	10-28
Vineland SOCIALIZATION			
AV	38.5	6.7	29-46
APV	15.1	11	6-35
Vineland ADAPTIVE BEHAVIOUR COMPOSITE			
AV	33.5	4.5	29-39
APV	14.3	6.3	6-23
MOTHER AT SCHOOL IN YEARS			
AV	12.4	1.3	11-15
APV	10.8	0.7	10-12
MOTHER'S FURTHER EDUCATION IN YEARS			
AV	2	2	0-4
APV	0	0	0
MOTHER'S TOTAL EDUCATION IN YEARS			
AV	14.4	2.1	11-17
APV	10.8	0.7	10-12

SOCIAL CLASS	I	II	III	unsp.
AV	-	3	4	-
APV	-	4	2	-

Table 4.21: Characteristics per Diagnostic Group of Participants in Study B

AV N=7 APV N=6	MEAN	STD. DEV.	RANGE
AV (N=7)			
Chronological Age	62	8.7	52-75
Leiter MA	47.1	9.7	36-60
Leiter IQ	77.8	21.1	53-103
Reynell VERBAL COMPREHENSION	26.5	6.3	15-34
Reynell EXPRESSIVE VOCABULARY	27	8.7	17-40
Vineland COMMUNICATION	28.4	7	22-39
Vineland DAILY LIVING SKILLS	34.5	5.9	26-43
Vineland SOCIALIZATION	38.5	6.7	29-46
Vineland ADAPTIVE BEHAVIOUR	33.5	4.5	29-39
MOTHER at school in years	12.4	1.3	11-15
MOTHER's total education in years	14.4	2.1	11-17
MOTHER's further education in years	2	2	0-4
SOCIAL CLASS			
I	1		
II	2		
II	3		
unsp.	-		
APV (N=6)			
Chronological Age	49	10.3	40-69
Leiter MA	11.6	18.4	0-41
Leiter IQ	27.1	44.2	0-103
Reynell VERBAL COMPREHENSION	--	--	--
Reynell EXPRESSIVE VOCABULARY	--	--	--
Vineland COMMUNICATION	11.8	6	2-19
Vineland DAILY LIVING SKILLS	16.3	6.6	10-28
Vineland SOCIALIZATION	15.1	11	6-35
Vineland ADAPTIVE BEHAVIOUR	14.3	6.3	6-23
MOTHER at school in years	10.8	0.7	10-12
MOTHER's further education in years	0	0	0
MOTHER's total education in years	10.8	0.7	10-12
SOCIAL CLASS			
I	-		
II	4		
II	2		
unsp.	-		

5. PROCEDURE DURING HOME VISITS

Home observations are important to this study, which is attempting to obtain information about communication in ordinary family circumstances. The time of the visits was prearranged to suit mother and child. During the visits the following were done:

- the researcher administered a standard interview with the mother (Vineland)
- the researcher administered two standardized psychological tests to the child; one non-verbal (Leiter) and the other verbal (Reynell)
- the researcher asked the mother to play with her child as she usually does and filmed for approximately 20 minutes, while they were playing with a selection of toys which were chosen for the study and which were selected to be likely to elicit symbolic play
- the mother completed before and after the completion of the filming the Noble's Semantic Differential Measure (NSDM which was also used in the Pilot Study, Appendix I.C.)[2].

5.1. Procedure used with Verbal Autistic, Developmentally-delayed and Pre-verbal Autistic Children

Usually three visits were made to each child[3]. At the first visit the researcher started to administer the Vineland with the mother and the Leiter with the child. The administration of the Vineland and of the Leiter were completed and the first part of the Reynell test was administered with the child at the second visit. At the third and last visit the Reynell was completed, and mother and child were filmed for approximately 20-25 minutes while they were playing with the toys provided by the researcher.

According to the manual of the Vineland Adaptive Behaviour Scales (Sparrow et al, 1984), it is permissible for a second session to be

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[2] Results on the NSDM will not be presented in this thesis.

[3] The researcher was trained and supervised in use of the psychological tests with the help of Clinical Psychologists and Speech Therapists and by administering the tests with several non-delayed children for practice in the Nursery School of the Psychology Department.

arranged for the completion of the interview. It seemed to be tiring for the mother to answer questions asked by a person whom she had just met at the same time as she was trying to take care of her child. The children were interested in obtaining the researcher's or the mother's attention, so it was necessary for something to be initiated with them. The Leiter and the Reynell had to be completed on different sessions and, in some cases to be administered for a second time, because it was not always easy to establish a good rapport with the child.

5.2. Procedure used with Non-developmentally-delayed Children

Two visits were adequate for the collection of the data in this group. The same procedure as above was followed, excluding the Leiter because this test is not appropriate for children 2 years old or younger. Some children in the study were younger than 2 years and some just 2 years old. However, there was no intention to equate the autistic with the non-delayed group on this test. We can assume from the mothers' information on SSI-ND and Vineland, and from the children's performance on Reynell that they function at an intellectual level appropriate to their chronological age.

6. Filming Procedure and Equipment for Study A and Study B

Each child was filmed playing at home with his/her mother. As it was not possible to make the video recording from a separate room, the presence of the researcher was always obvious. Some children were influenced more by the camera's presence rather than the researcher's. The mother was asked to use the room and the situation where she usually played with her child. In most cases this was the living room. Some mothers used the child's table and chairs (Figure 4.2: Scheme 1) and others sat on the floor (Figure 4.3: Scheme 2). The toys were placed between the partners to encourage initiations from the child.

Figure 4.2: Filming Situation Used in the Main Study

SCHEME 1

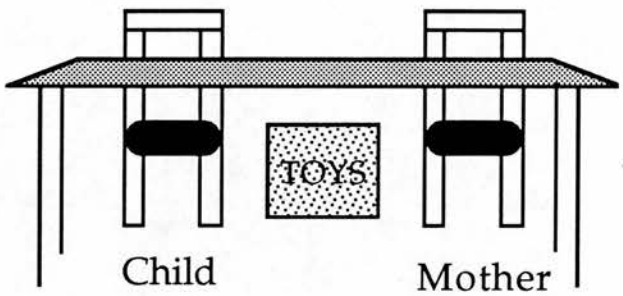
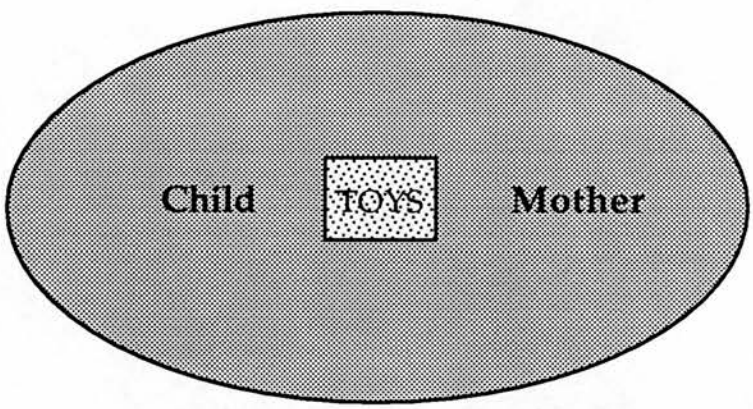


Figure 4.3: Filming Situation Used in the Main Study

SCHEME 2



The mothers completed the NSDM before the filming while the researcher was arranging the space and the lighting of the room. Mothers were asked to play normally and naturally without doing anything specially for the study. Mother and child sat at the agreed place and the toys were introduced all together in front of the pair.

The intention was to film about 20 minutes of play, but sometimes the length of time a child remained motivated to communicate, to attend and to complete a play sequence varied (minimum 18 minutes; maximum 30 minutes).

Four sets of toys were used in the study:

SET 1: a doll, a basket bed, a bed cover, a mirror, a brush, a baby's milk bottle

SET 2: a picnic towel, two cups and saucers, a teapot with a lid, two teaspoons, two dishes, a serving dish, two spoons, two forks, two knives, a basket, two carrots, an orange, a tomato, a cauliflower, grapes, bananas

SET 3: two trees, a water trough, a sheep, a cow, a horse, a pig

SET 4: a teddy bear, a telephone, a police car, an iron

All the toys were plastic miniatures of real objects. Sets 1, 2, and 3 were presented in transparent plastic bags. The toys of Set 4 were presented individually.

The equipment used for filming and editing the videotapes was the same as in the Pilot Study. The tripod was used only at the beginning during the filming of 3 dyads. It was found to be more convenient to hold the camera on the shoulder because the children were moving around and it was difficult to obtain a good picture.

After the filming the mothers completed the NSDM and they were asked to sign the consent forms (Appendix II.D.1-2). They were also asked whether or not their child acted very much as usual (Question 1), and whether or not the communication and the play between them was the same as usual (Question 2). If a mother gave negative answers to either of these questions, she was asked to state the reason and to describe what happens usually (Tables 4.23-4.25). In most cases the mothers judged that the recordings were representative of the way communication usually went with their child in play (Table 4.22).

Table 4.22: Frequency of Positive and Negative Answers to Questions 1 and 2

		AV	DD	ND	APV
Question 1	**yes**	6	6	6	5
	no	1	1	1	1
Question 2	**yes**	7	7	7	5
	no	0	0	0	1

Tables 4.23-4.25 give detailed information about the mothers' answers to the above questions. Even though they were asked to comment only if their answer was negative, sometimes they also commented on their positive answer.

Table 4.23: Verbal and Pre-verbal Autistic Children

Mothers' comments on why the video data were or were not representative

CS (AV)	
Q. 1 no	Does not usually concentrate so much; he would tend to run away and do something else. Play content much the same, but it would spread over a much longer period of time.
Q. 2 yes	
SI (AV)	
Q. 1 yes	
Q. 2 yes	We usually have to repeat set routines, e.g. 'drinking-be hot!', more than just a couple of times.
TF (AV)	
Q. 1 yes	
Q. 2 yes	But we do not have dolls or other pretend play toys. We usually do puzzles or drawings or trains. It was usual for him to ignore me at times and listen at others.
LN (AV)	
Q. 1 yes	
Q. 2 yes	Does not usually play with the toys. She likes to watch videos or wrestle. We usually only sit with toys when we are doing speech therapy together. When we 'play' with toys, or try to, she runs away. I feel that she gets no enjoyment from toys. She has to be 'taught' how to play.
RB (APV)	
Q. 1 no	I would not choose these toys as I know they would not interested him. Also I would not try to keep him in one place for such a long time.
Q. 2 no	Same as above.

Table 4.24: Developmentally-delayed Children

Mothers' comments on why the video data were or were not representative

RD	
Q. 1 no	He knew the camera was on.
Q. 2 yes	
GW	
Q. 1 yes	
Q. 2 yes	But perhaps not so long and more spontaneously. Also I would not have intervened if he was playing happily. Usually I am waiting for him to come and ask me to join in.
SR	
Q. 1 yes	
Q. 2 yes	Although I probably am a bit more involved, and we possibly 'giggle' a bit more.

Table 4.25: Non-developmentally-delayed Children

Mothers' comments on why the video data were or were not representative

CM	
Q. 1 yes	
Q. 2 yes	But I think that perhaps I prompted him more than usual, rather than let the play flow as normal as usual.
BR	
Q. 1 yes	But usually he is much more active and would not often sit for that long! But then maybe I wouldn't either.
Q. 2 yes	But I am probably slightly inhibited in this situation and would be more physically affectionate normally, i.e. would touch him more.
SG	
Q. 1 no	He was unused to the toys and took a while to adapt. He was also very aware of the camera. Otherwise his attitude was much the same as normal.
Q. 2 yes	A little stilted due to the circumstances. After the filming, the mother mentioned that she is usually louder when playing with her son but she was quieter because of the camera; she does not like generally speaking or being filmed or photographed but she agreed just to help with the study; she usually plays with her son with much more toys and with many cars.

CHAPTER 5 CODING SYSTEM FOR MICROANALYSIS AND STATISTICAL ANALYSIS OF THE VIDEO DATA

1. DEVELOPMENT OF THE METHOD FOR ANALYSING MOTHER-CHILD COMMUNICATIVE PLAY

The coding scheme is based on a general theoretical background derived from observation of behaviours. The intention was to develop an instrument for classifying the functions of behaviours in three areas: play, two-sided communication and interpersonal or shared play. An outline category system was designed after completion of the Pilot Study. Then all the tapes from the Main Study were reviewed carefully and brief descriptions of the child's and the mother's behaviour were made.

A new instrument had to be developed in order to meet the specific aims of the present research (see Chapter 2, Section 8.2: Strategy for Planning this Research), but the inspiration for this analysis came from different sources. Information about the different ways of treating interactional sequential data was considered, as were descriptions of coding schemes with similar purposes.

According to Bakeman and Gottman (1986) a study employing systematic observation has the following requirements: one needs to have a clear question, to describe each code, to keep the coding scheme simple, to have distinct codes which are mutually exclusive (one code is associated with a specific event) and exhaustive (there is a code for each event). Some possible strategies of analysing sequential data are:

- Interval Recording
  A period of time is divided into relatively brief intervals. Observers then either categorize each interval or note which codable events, if any, occurred during each interval. Interval coding has been widely used but it is much criticized because it does not provide accurate information about behaviours; more than one code can occur within an interval or near the boundaries of intervals.

- Cross-classifying Events
  The observer needs to have specific and limited questions. A specific event is described, and what caused it and how it was resolved are determined. It is a very efficient way for recording behavioural sequences.

- Event Coding
  Onset and offset times of defined events are coded. Information is obtained about the frequency, the duration and the relative occurrences of different behaviours.

It was decided that Event Coding would be used to obtain detailed analysis of the interaction between child and mother, thereby avoiding the disadvantages of interval recording. Cross-classifying Events, though it is highly informative for selected behaviours, did not fulfil the aim of providing a comprehensive description of the interaction.

The definition of the play categories was based on the papers of Ungerer and Sigman (1981), Trevarthen and Marwick (1982), O'Connell and Bretherton (1984) and Baron-Cohen (1987). The communicative categories come from papers of Hubley and Trevarthen (1979), Trevarthen and Marwick (1982), Sigman, Mundy, Sherman and Ungerer (1986), and Kasari, Sigman, Mundy and Yirmiya (1988). The definition of the levels of engagement was adopted from a study measuring musical engagement of psychiatric outpatients with a music therapist (Pavlicevic and Trevarthen, 1989).

All this information was revised, expanded and complemented by additional definitions and categories to meet the needs of the current study. Once a preliminary coding scheme was created, it was tested in analyses of several tapes from the Main Study to make sure that it was suitable. Some codes were then withdrawn, others were revised or collapsed and new ones were added. This revised coding scheme was then applied on a sample of tapes and a few confusing definitions were clarified. Afterwards, the first three tapes were analyzed and the final coding scheme was confirmed to be effective. These first tapes were re-analyzed again, after the total analysis was completed, and only these new codings were included in the statistical analysis.

The final coding scheme includes 42 categories with several elements in each category. The completion of the coding scheme took 4 months. The total analysis of the tapes occupied 10 months and the entry of the data into the computer 2 months.

2. Full Coding System Used for Microanalysis

The full coding system classified the behaviour functions into 5 major function groups which consist of categories diagramed in Table 5.1. These 5 function groups are as following:

- Play, describing the mother's and the child's playful activities with objects or with each other.
- Interpersonal Engagement, concerning successful and unsuccessful attempts in which mother and child communicate through regulation of each other's interpersonal motives.
- Joint Attention, concerning ways in which mother and child communicate or not as persons through regulation of each other's attention.
- Communication, describing different forms of communicative expressions.
- Initiatives, describing the classification of categories for 'Play' and 'Communication' within the larger definition of Initiations and Responses.

A selected portion of 5 minutes per dyad was analysed sequentially in detail to record onset and offset times of events for child and mother separately. The unit of event is an 'utterance' or an 'object directed act'. Each event was coded as an 'initiation' or a 'response', since the aim of this thesis was to develop a system for recording the reciprocal exchanges between partners.

All the categories defined in the coding scheme are exhaustive and mutually exclusive. However, certain categories were included in the two function groups 'Play' and 'Communication', e.g. categories in 'Communication' such as 'inform', 'ask info', 'positive reply' can also each be classified under the heading of 'Play'; which 'Play' categories they

will be, will depend upon the communicative message they convey about 'Play'. When more than one play category was occurring at the same time, their messages were classified as verbal (V), or as gestural (G), or as verbal and gestural (V+G) under both the the heading 'Play' and 'Communication. For example, if a mother was simultaneously involved in 'exploratory' play and 'symbolic' play (searches for a certain toy while she is 'informing' the child that 'the tea is hot'), both initiatives would be coded; one for 'exploratory' and one for 'symbolic' play. The initiative in 'symbolic' play transmits a verbal message which would be classified under 'Play' and indicated as verbal (V), and also under 'Communication' in the category 'inform' and indicated as verbal (V). Therefore, it was clarified whether or not initiatives in play categories were conveying a communicative message. This led to the definition of 45 elements for categories of 'Play' and 21 elements for categories of 'Communication' (only the category 'eye contact' of 'Communication included 8 elements). Table 5.3 summarizes these elements and Table 5.2 explains the abbreviations used in the coding of the elements.

Levels of 'Interpersonal Engagement' and the Focus of 'Joint Attention' were coded every time an 'initiation' or 'response' or a 'response to a response' was coded. 'Directiveness' of 'initiations' and 'Certainty' of 'initiations' and 'responses' were coded only when the relevant categories were occurring. Table 5.4 shows a sample of a 24 second sequence coded for a mother and a child.

Table 5.1: Summary Table of Microanalytic Interacting Behavioural Categories

Play	1. Exploratory 2. Combinatorial 3. Instrumental 4. Symbolic 5. Ambiguous 6. Minimal
Interpersonal Engagement	1. No contact 2. Minimal contact 3. Contact without response 4. One-sided cooperation 5. Two-sided contact; cooperative but not fully shared 6. Two-sided contact; cooperative and fully shared
Joint Attention	1. Objects and Themes 2. Focus of Joint Attention ('other', 'other+object', 'other+objects','other/theme', 'object', 'environment', 'no theme')
Communication	1. Cooperative messages ('give', 'offer', 'accept', 'request object', 'demonstrate', 'display') 2. Directive messages ('point out', 'attract marker', 'ask to do', 'take', 'physically hold', 'prohibit') 3. Initiative in messages ('ask help/info', 'inform', 'converse') 4. Reaction to messages ('assist', 'positive reply', 'negative reply', 'comply', 'expand', 'imitate', 'positive feedback') 5. Interpersonal messages ('eye checking', 'short eye contact', 'laugh or smile', 'other sub-verbal', 'other non-verbal', 'eye contact + ' and 'eye contact * ') 6. Off-task behaviours
Initiatives	1. Definition of an initiation and a response 2. Certainty of an initiation and a response ('unclear', 'unintelligible', 'tight', 'loose') 3. Directiveness of an initiation ('indirect', 'direct')

Table 5.2: Index of Abbreviations used for the Elements of Categories in 'Play' and 'Communication'

M	Mother
C	Child
I	Initiation
R	Response
RR	Response to a Response
RRR	Response to a Response to a Response
4R	Four Responses
MR	More than Four Responses
V	Verbal
G	Gestural
V+G	Verbal + Gestural
+	Happening simultaneously
I + or R +	Initiate eye contact or Respond to eye contact
I * or R *	Look elsewhere than the partner or Respond to the partner's initiation of looking elsewhere

Table 5.3: Summary Table of Elements for the Categories of 'Play' and 'Communication'

PLAY		COMMUNICATION	
Exploratory, Combinatorial, Instrumental, Symbolic, Ambiguous and Minimal Play		Cooperative Messages, Directive Messages, Initiative in Messages, Reaction to Messages and Interpersonal Messages	
MI	CI	MI	CI
MI+MI	CI+CI	MIG	CIG
MI+MIG	CI+CIG	MIV	CIV
MI+MIV	CI+CIV	MR	CR
MI+MI V+G	CI+CI V+G	MRG	CRG
MIG	CIG	MRR	CRR
MIV	CIV	MRRR	CRRR
MIV+G	CIV+G	MRV	CRV
MI+MR	CI+CR	M4R	C4R
MI+MRG	CI+CRG	MMR	CMR
MI+MRR	CI+CRR	OTHER	
MI+MRV	CI+CRV		
MR	CR		
MR+MR	CR+CR	Eye Contact + and Eye Contact *	
MR+MRG	CR+CRG	MI+	CI+
MR+MRV	CR+CRV	MI+G	CI+G
MRG	CRG	MI*	CI*
MRR	CRR	MI*G	CI*G
MRRR	CRRR	MR+	CR+
MRV	CRV	MRR+	CRR+
M4R	C4R	MR*	CR*
MMR	CMR	MRR*	CRR*
OTHER		OTHER	

for Video Analysis

START TIME.....STOP TIME.....

M = Mother , C = Child, I = Initiates, R = Responds, V = Verbally, G = Gesturally, V+G = Verbally and Gesturally

	ASK TO DO	ATTRACT MARKER	INFORM	POSITIVE REPLY	NEGATIVE REPLY	PROHIBIT	CONVERSE	EXPAND	IMITATE	POSITIVE FEEDBACK	+ - EYE CONTACT	PHYSICALLY HOLD	OFF-TASK	SUB-VERBAL	OTHER NON-VERBAL	EYE CHECK	SHORT EYE CONTACT	LAUGH OR SMILE	COMPLY	DIRECT	
1			MI																		TELEPHONE.
2																					
3	MI										MI+									indirect	ARE YOU GOING TO SAY HALLO ?
4																					
5	MIV										MI+G									indirect	WOULD YOU SAY HALLO?
6											MI+										
7	MI										MI+									direct	SAY HALLO.
8							MI				MI+										YES.
9											MI+										
10							MIV														YES.
11							MI												MR		BYE.
12																			MR		
13							MI												MR		HALLO JANE!
14																					
15							MIV														BYE.
16																					
17																					
18	MIV										MI+G									direct	SAY MATHEW.
19			MIV								MI+G										MATHEW.
20																					
21																					
22																					
23																					
24														CI							CHILD VOCALIZES.
25																					
26																					
27																					
28																					

Table 5.4: Coding Sheet

CODING SCHEME FOR.....DIAGNOSIS..... DATE OF FILMING.....STUDY.....

M = Mother , C = Child, I = Initiates, R = Responds, V = Verbally, G = Gesturally, V+G = Verbally and Gesturally

	TIME start	TIME finish	EXPLORATORY	COMBINATORIAL	INSTRUMENTAL	SYMBOLIC	AMBIGUOUS	MINIMAL	LEVEL	CERTAINTY	OBJECTS	THEME	GIVE	OFFER	REQUEST OBJECT	ASK HELP/INFO	ACCEPT	TAKE	DEMONSTRATE	DISPLAY	POINT OUT	ASSIST
1	01:02:59	01:03:57	MI						6		phone	phone										
2	01:03:57	01:05:53			MI				6		phone	phone										
3	01:05:53	01:07:13				MI			+3A		child/toys	child/toys										
4	01:07:13	01:08:41			MI				2		phone	phone										
5	01:08:41	01:09:97			MI	MIV+G			-4A		child+phone	child+phone										
6	01:09:97	01:10:97	MI						6		child+phone	child+phone								MI		
7	01:10:97	01:12:21				MI			6		child+phone	child+phone										
8	01:12:21	01:13:13				MI			6		child/phone	child/phone										
9	01:13:13	01:13:77	MI						6		child/phone	child/phone										
10	01:13:77	01:14:81	MI			MIV			6		child	child/phone										
11	01:14:81	01:15:89			MR	MI			6	tight	child+phone	child+phone										
12	01:15:89	01:17:50			MR				6	tight	child+phone	child+phone										
13	01:17:5	01:18:29			MR	MI			6	tight	child+phone	child+phone										
14	01:18:29	01:18:81	MI						6		child/phone	child/phone										
15	01:18:81	01:19:93	MI			MIV			6		child/phone	child/phone										
16	01:19:93	01:22:57			MI				6		child+phone	child+phone										MI
17	01:22:57	01:23:13	MI						6		child/phone	child/phone										
18	01:23:13	01:24:49			MI	MIV+G			-3A		child+phone	child+phone										
19	01:24:49	01:25:17			MI	MIV+G			-4A		child+phone	child+phone										
20	01:25:17	01:25:73			MI				6		child+phone	child+phone										
21	01:02:59	01:05:21	CI						6		phone	phone										
22	01:05:21	01:10:01	CI						2		car	car										
23	01:10:01	01:13:25	CR						6	tight	mother+phone	mother+phone					CR					
24	01:13:25	01:15:01			CI				6	unintelligible	phone	phone										
25	01:15:01	01:18:25			CI				6		mother+phone	mother+phone										
26	01:18:25	01:23:41			CI				6		phone	phone										
27	01:23:41	01:24:49	CI						2		car	car										
28	01:24:49	01:26:37	CR						6	tight	mother+phone	mother+phone					CR					

2.1. Play

The function group 'Play' consists of 6 categories which classify the play acts of either mother or child as an 'initiation' or a 'response' according to the way that they used objects or to the messages transmitted about the objects or each other. The first 4 play categories, -- 'exploratory', 'combinatorial', 'instrumental' and 'symbolic', are the principal ones, and they form a hierarchy; the lowest being 'exploratory' play and the highest 'symbolic' play. The last 2 play categories, -'ambiguous' and 'minimal' include play acts which could not be coded in the first 4 categories.

Exploratory

An activity which conveys no more than minimal functional information.

- Secondary circular reactions: mouthing, waving, banging, fingering, simple holding of objects; searching for toys, picking objects up; throwing, rolling, twiddling, sniffing. No attention paid to the conventional function of the objects.
- Inquiring/Identifying: pointing to an object; giving, offering, accepting, taking or displaying an object without denoting a function; asking questions about objects "what is this"; naming objects or acts without showing interest in their function; simple description of objects; asking questions while looking at the mirror.
- Exploring/Watching: visual exploration of objects; exploration of the environment; watching partner's activities.

Combinatorial

Combination of objects, excluding behaviours that perform meaningful functional associations of objects, e.g. placing a cup on a saucer, putting a spoon into a cup or putting the lid on a dish.

- Relating objects: touching or banging objects together; stacking objects, arranging them, bringing two objects closer to each other, making spatial configurations; classifying or grouping objects, using one object as a container to hold another, putting one inside another. No attention is paid to a conventional function.

Instrumental

The use or attempted use of conventional objects, or suggestions to use objects according to their function. Naming activities according to their function ("I will feed the doll") or naming objects while attending to their function (naming "bananas" and putting them on the dish).

- Self-directed, e.g. brushing one's hair.
- Doll-directed, e.g. feeding a doll with a spoon or bottle.
- Other-directed, e.g. holding a telephone receiver to the mother's ear, offering and accepting a cup, holding the mirror to the other person.
- Object-directed, e.g. looking in a mirror, placing the top on the teapot, pressing the buttons of the phone making it ring, taking objects out of the bag or putting objects in the bag.

Symbolic

- Substitute: use an object as a different object, e.g. using a cup as a telephone receiver.
- Impersonate: use of a doll as an independent agent, e.g. propping a bottle in a doll's arms as if it could feed itself, expression of emotions, beliefs as if the object is a person (role taking); generally use of objects as persons.
- Imagine: creation of objects, people, events or descriptions having no physical representation in the immediate environment, e.g. making pouring sounds as imaginary tea is poured from a teapot into a cup, making car noises, making animal noises, feeding doll with bottle and making sounds of drinking or tasting.

Ambiguous

Acts were coded as ambiguous if they could not be classified in any play category or because they were unclear in their execution and purpose.

Minimal Play

Communicative categories such as 'eye contact', 'converse', 'positive feedback', 'imitate', 'attract marker', 'physically hold'; other categories of the function group 'Communication' with no reference to one of the above categories of play; initiations coded as 'unclear' or 'unintelligible'. Minimal play can have an immediate interpersonal function and does not transmit any message for play.

2.2. Interpersonal Engagement

The function group 'Interpersonal Engagement' consists of 6 levels which classify the play act and/or the communicative expression of either mother or child according to the degree that the subject coded is engaged with the other person. It aims to contribute to the definition of a category for 'Communicative Play' or 'Shared Play' or 'Social Play'. Every time that a level of engagement was noted for the subject coded, what was happening immediately previously and immediately afterwards was taken into account as well as the interpersonal state of the other person.

Level 1: No Contact

- Neither mother nor child attends to the other or to the same object, task or activity as the other; the acts of the two are not related.
- The subject coded is engaged in solitary activity, paying no attention to the other.

Level 2: Minimal Contact

- The subject coded is engaged in solitary activity, paying minimal attention to the other.
- Neither mother nor child attends to each other or to the same object, task or activity as the partner; their acts are separately directed, independent and the contact is mediated with minimal turn-taking, or mutual and synchronous activities. Sometimes their activities are incoherent and contradictory.
- Either mother or child attends to each other or to the same object, task or activity but their acts do not have the same goal or theme. Their acts are independent and the contact is characterized by minimal turn-taking, or mutual and synchronous activities. Sometimes there is no coherence in their activities.

Level 3: Contact without Response

+3A: Mother initiates appropriately-Child fails to respond

- The mother tries to meet or match some or all of child's acts. However, when the mother intervenes or brings about a change the child either continues to act as before or acts in a new way unrelated to the mother's initiative.

-3A: Mother initiates inappropriately-Child fails to respond

- The mother intervenes or brings about a change, but she is not trying to meet or match some or all of child's acts and does not understand what the child is trying to

do. The child continues to act as before or acts in a new way unrelated to the mother's initiative.

+3B: Child initiates appropriately-Mother fails to respond

- The child tries to meet or match some or all of mother's acts. However, when the child intervenes or brings about a change, the mother continues to act as before or acts in a new way unrelated to the child's initiative.

-3B: Child initiates inappropriately-Mother fails to respond

- The child intervenes or brings about a change, but he/she is not trying to meet or match some or all of mother's acts and does not understand what the mother is trying to do. The mother continues to act as before, or she acts in a new way unrelated to the child's initiative.

Level 4: One-sided Cooperation

+4A: Mother initiates appropriately-Child responds

- The mother tries to meet or match some or all of child's acts. When she intervenes or tries to bring about a change, the child tries to respond or to initiate and follow with attention to the mother.

-4A: Mother initiates inappropriately-Child responds

- The mother does not try to meet or match some or all of child's acts. When she intervenes or tries to bring about a change, without understanding what the child tries to do, the child tries to respond or to initiate and follow with attention to the mother.

+4B: Child initiates appropriately-Mother responds

- The child tries to meet or match some or all of mother's acts. When he/she intervenes or tries to bring about a change, the mother tries to respond or to initiate and follow with attention to the child.

-4B: Child initiates inappropriately-Mother responds

- The child does not try to meet or match some or all of mother's acts. When he/she intervenes or tries to bring about a change, without understanding what the mother is trying to do, the mother tries to respond or to initiate and follow with attention to the child.

Level 5: Two-sided Contact; Cooperative but Not Fully Shared

- The subject coded observes or takes part in the partner's ongoing activity while doing something else at the same time that does not contribute to the other's activity.

Level 6: Two-sided Contact; Cooperative and Fully Shared

Either mother or child is able to meet or match some or all of each other's acts. This level can take either of the following forms:

- Both partners pay attention to the same task and both act constructively. Their contact is characterized by mutual, synchronous and imitative acts, turn-taking activities or teasing.
- Both partners pay attention to the same task; one is active and the subject coded watches or takes part with full interest.

Definition of Terms for Interpersonal Engagement

level: degree of engagement,

engagement: the establishment of mutual contact in communication; synchronicity and turn-taking in play,

change: to introduce a new activity which is not related to the preceding activity (e.g. change to a new play theme), or to change to a new activity within the same play theme which is not related to the other person's activity; taking a new turn was not considered as a change,

meet: to initiate an act, task, activity which belongs to other's expressed interest or relates to other's activities,

(+) appropriately: to initiate in the same play theme or to introduce a new play theme which is tuned in with the other's interests; the receiver does not have to break his intentional flow in order to respond. It complements the other's behaviour and is occurring while the other is attending,

(-) inappropriately: to initiate intrusively and to break the other's flow of activity. The initiation does not belong in the same play theme and/or it is not tuned in with the other's interests. It is occurring while the other person is not attending,

response: a behaviour which involves cooperating or paying attention not necessarily to comply or to reply; a response actually in this context can be a relevant initiation in contrast to the response defined later (see this Chapter, Section 2.5: Initiatives),

+ or - : for an initiation to be coded as one of the + or - levels, it has to be a) directed to the other person having a communicative component and b) obvious and apparent to the other person, but c) not Level 1, 2 or 6 (it is not sensible to code + or - when the dyad definitely is or is not in communication) and d) not an initiation occurred as taking a turn in Level 6.

2.3. Joint Attention

The function group 'Joint Attention' consists of 2 sections which classify the play act and/or the communicative expression of either mother or child according to the focus of attention.

Objects and Themes

The first section 'Objects and Themes' describes the objects that mothers and children could use in their interaction (Column B) and the classification of these objects into themes (Column A). However, a 'Play Theme' is not always defined by the use of objects and their respective themes because an object was not consistently used in the interaction of the dyad (see Focus 4, 5, 6 and 7).

A. THEMES	B. OBJECTS
Theme 1: doll	a doll, a basket bed, a bed cover, a baby's milk bottle
Theme 2: mirror	a mirror, a brush
Theme 3: tea time	cloth, two cups and saucers, a teapot with a lid, two teaspoons, two dishes, a serving dish, two spoons, two forks, two knives, a basket, two carrots, an orange, a tomato, a cauliflower, grapes, bananas
Theme 4: farm	two trees, a water trough, a sheep, a cow, a horse, a pig
Theme 5: teddy bear	teddy bear
Theme 6: telephone	telephone
Theme 7: police car	police car
Theme 8: iron	iron

Focus of Joint Attention

The second section 'Focus of Joint Attention' consists of 7 categories; these categories define cases where the focus of attention was either missing (Focus 7), or was an object or objects (Focus 5), or an object and the partner (Focus 2 or 3), or the partner (Focus 1 or 4), or the environment (Focus 6). These categories are listed below and definitions are given, including an example under Column A -- 'Object(s) or Person or Else' and Column B -- 'Play Theme(s)', when the subject coded is the child.

A. OBJECT(S) or PERSON or ELSE	B. PLAY THEME(S)

Focus 1

other (mother)	other (mother)

The subject coded gives eye contact to other person without using any object.

Focus 2

other+object (mother+cup)	other+theme (mother+tea time)

The subject coded is 'looking at' or 'watching' or 'engaging' the other person, while the subject is using an object or is referring to an object or is paying attention to the object which the other person holds, or they act together on the same object.

Focus 3

other+objects (mother+doll+pig)	other+themes (mother+doll+farm)

The subject coded reacts with a 'loose' response giving eye contact to the object that the other person holds while the subject is acting on another object.

Focus 4

other/theme (mother/tea time)	other/theme (mother/tea time)

The subject coded is 'looking at' or is 'watching' the other person; he or she may comment on other's acts, or give eye contact to the other person; the subject is not using any object but the other person may use an object.

Focus 5

object(s) (cup)	theme (tea time)

The subject coded is paying attention to an object, or is using an object, or is referring to an object, without 'looking at' or 'watching' or 'engaging' the other person.

Focus 6

environment	environment

The subject coded is not using an object or looking at the other person, but is looking at the researcher or at the toys or somewhere else.

Focus 7

no theme	no theme

The subject coded does not have a focus of attention.

2.4. Communication

The function group 'Communication' consists of 6 sections which describe 30 categories of positive or negative communicative expressions. These communicative expressions can be either an initiation or a response (for definition, see this Chapter, Section 2.5: Initiatives). Categories such as 'give', 'offer', 'inform', 'converse', 'assist', 'eye checking', 'short eye contact', 'laugh or smile', 'sub-verbal', 'other non-verbal', 'eye contact + ' and 'eye contact * ', were coded as Initiations or Responses. Categories such as 'request object', 'demonstrate', 'display', 'point out', 'attract marker', 'ask to do', 'take', 'physically hold', 'prohibit', 'ask help/info' and 'off-task behaviours' were coded only as Initiations. Categories such as 'accept', 'positive reply', 'negative reply', 'comply', 'expand', 'imitate' and 'positive feedback' were coded only as Responses. The group 'Communication' was used to describe either the autonomous occurrence of communicative categories or the complementary occurrence of communicative categories to 'Play'.

Cooperative Messages with Objects

This section comprises the following 6 categories concerned with attempts to establish shared goals or joint actions on objects:

give: put object into other's hand or mouth, or attempt to,

offer: hold out object towards other, within reach of other, encouraging other to accept it,

accept: accept object that has been offered or is being given,

request object: ask for object verbally and/or non-verbally which is in other's possession or in other's near space,

demonstrate: show how to do an operation on an object or an activity,

display: show object or activity without demonstration and drawing of attention.

Directive Messages with Objects or about Objects, Acts and Events

This section includes the following 6 categories concerned with attempts to obtain the attention of the other or to impose a directive instruction on the other person:

point out: bring object into the field, or a locus of attention of the other, to give focus to interest, index pointing or eye pointing,

attract marker: call for attention verbally e.g. "look", "see", or by using the other's name or use of name and touching the partner,

ask to do: ask other to do an act in the interrogative form (ID=indirect) e.g. "can you do this?", "what about", "are you going?", or as a suggestion (ID=indirect) e.g. "let's do", "we are going to", or in the imperative form (D=direct) e.g. "do this",

take: take object from other person without having been offered,

physically hold: hold a part of other's body to perform an act to keep on task or maintain his/her attention,

prohibit: prohibit an action verbally and/or non-verbally.

Initiative in Messages about Objects, Acts, Events or Persons

This section consists of the following 3 categories concerned with attempts to gain a reaction in relation to an object, an act, an event or the self, or to transmit a verbal message about an object, an act, an event or the other person:

ask help/info: ask for information or ask for help or ask for confirmation,

inform: express or inform other of a fact about self, other or an object; describe activities, comment on partner's activities, produce informative utterances with interrogative intonation e.g. "the phone ringing?", correct partner's utterances,

converse: songs, interpersonal expressions such as: "thank you", "hallo", "bye", filler phrases such as: "right" (it does not imply a positive reply), "you see", "what else is in here?", "what is here?" (without asking for information); greetings, baby talk, tag questions e.g. "it is a big fat, isn't it?" or child says informing "I am speaking on the phone" and the mother replies conversing "are you?"; exclamations and paralinguistic expressions were coded as 'converse' when they did not appear immediately in advance of an utterance e.g. "oh (time gap) it is hungry!"; otherwise they were coded with the utterance that they were denoting e.g. inform "oh it is hungry!"; conversation which does not transmit any substantial information e.g. on the phone; utterances in the interrogative form which do not ask for information but rather inform or comment e.g. "is the horse coming through the gate?" was coded as 'converse', but "the horse is coming through the gate" was coded as 'inform'.

Reaction to Messages about Objects, Acts, Events or Persons

This section includes the following 7 categories concerned with attempts to respond to verbal or non-verbal messages requesting a reaction, or to respond independently from the verbal or non-verbal message transmitted about an object, an act, an event or the other person:

assist: help other in the execution of their action, or arrange an object in such a way as to help other to act on the object or give to the other some verbal cues to gain a response,

positive reply: inform, agree or give permission or confirm verbally and/or non-verbally in response to a question, or suggestion or statement,

negative reply: negate an asserted fact, an act, a belief or disagree or deny a request; failures to comply with a suggestion or request were not coded,

comply: comply in response to a direct or indirect suggestion, or request or prohibition or attempt to take the object of your interest,

expand: a verbal and/or non-verbal expansion or elaboration of the partner's activity e.g. the child says "Margaret" and the mother replies expanding "Margaret! and laughs"; the elements which constituted an expansion are not coded separately e.g. the child says "Margaret" and the mother replies expanding ' "Margaret!" and laughs', instead of expanding "Margaret!", and 'laughing',

imitate: reproduce other's acts and expressions, or echo other's utterance,

positive feedback: praise of other for ongoing activity, or positive acceptance of other's activity.

Interpersonal Messages about Persons, Objects, Acts, Events or the Environment

The section 'Interpersonal Messages' consists of the following 7 categories concerned with attempts to communicate as persons or to communicate as persons in relation to an object or the environment:

eye checking: the subject coded watches other's behaviours while he is glancing repeatedly at the other person with his eyes,

short eye contact: the subject coded gives a short eye contact at the beginning or middle or end of an utterance,

laugh or smile: the subject coded laughs or smiles,

sub-verbal: sub-verbal messages that could not be classified in the above defined categories were noted separately and details were kept e.g. vocalizations. 'Unclear' or 'unintelligible' utterances and silly noises were also coded under 'sub-verbal',

other non-verbal: non-verbal messages that could not be classified in the above defined categories were noted separately and details were kept e.g. touching,

eye contact + : partners look at each other towards eyes; the subject coded suddenly changes direction of gaze towards other or tries to establish eye contact or give eye contact to the other who is acting on an object or looking somewhere else other than at the object that has been mentioned or pointed out,

eye contact * : the subject coded avoids the other person when the other tries to establish eye contact; looks elsewhere from other's interests when he tries to establish eye contact, e.g. look at toys or look at researcher; changes direction of gaze suddenly while having been in eye contact or in communication; cases in which change of direction of gaze was by a movement of the head during communication were not coded as 'eye contact * '.

Off-task behaviours

Either mother or child is upset, walks away, makes silly noises etc.

2.5. Initiatives

Each category in the function groups 'Play' and 'Communication' was coded as an 'initiation', or as a 'response' for either mother or child. An initiation could be 'unclear' or 'unintelligible'. A response could be 'unclear' or 'unintelligible', 'tight' or 'loose'. These further definitions were used to complement the main categories and clarify the occurrences of some confusing behaviours.

Definition of an Initiation and a Response

Initiation

> Either mother or child starts a new activity that the partner has not immediately previously asked for, and that does not relate to the preceding behaviour; or relates to the partner's behaviour immediately previously, but adds new information, asks for new information or brings a new sequence into the interaction, changing the flow or focus of interaction. An initiation is not always directed to the other person.

Response

> Either mother or child performs an activity that relates to the partner's activity shortly before, as a direct response to an initiation or as a complementary comment or elaboration to partner's activity. A response is an act that continues and maintains the interaction, but that does not convey new information, or asks for new information, or changes the focus of interaction. A response to a response is a response to an immediately previous response.

Certainty of an Initiation or a Response

Certainty of an initiation or a response describes the clarity of the categories defined in the function groups 'Play' and 'Communication'. All comprehensible initiations were coded. However, in order to include uncertain cases the categories of 'unclear', 'unintelligible', 'tight' and 'loose' were defined. The communicative category of 'ask to do' was coded as 'indirect' or as 'direct'.

All initiatives were coded; unless they were comprehensible they were coded as 'unclear' or 'unintelligible'. An initiation or a response

was coded as 'unclear' when there was a definite verbal message transmitted but its content was not sufficiently clear to be transcribed. An initiation or a response was coded as 'unintelligible' when there was a sub-verbal message transmitted having meaningless content (e.g. vocalizations, silly noises, sounds). Additionally, responses could be coded as 'tight' or 'loose'.

A 'tight' response is defined as a reaction to verbal or non-verbal messages, apparently accepting their message. A 'tight' response can take any of the following forms:

- complete response in a category defined in the coding scheme

Mother: "is this your coffee?" ('ask info')
Child: "yes" ('positive reply')
M: requests object ('request object')
C: passes it to the mother ('give')

- partial response in the defined category

M: "put some more coffee in your cup" ('ask to do')
C: "yes", but he does not put any more in it ('positive reply')

- attempt to respond in the defined category

M: "is this your coffee?" ('ask info')
C: trying to say "coffee" ('positive reply')

- simply giving attention to the object which has been shown

M: "look" ('attract marker')
C: looks at object mentioned ('eye contact + ')

A response was coded as 'loose' when there was a relatively unspecific or unimaginative reaction to behaviours of the partner or to verbal or non-verbal messages. A 'loose' response can take any of the following forms:

- automatic response to the partner's act

Mother: drops the cup ('exploratory play') Child: catches the cup ('exploratory play')

- wrong reply which adds new information, but does not change the flow of interaction

M: "is this a cow?" showing the cow ('ask info') C: "it is a pig" ('positive reply')

- response called for did not occur

M: "is this your coffee?" showing the cup ('ask info') C: looks at the cup interrupting his activity ('eye contact + ')

- no action was explicitly called for, but the partner reacted

M: "oh, what a pretty baby!" ('inform') C: looks at the doll ('eye contact + ')

Directiveness of an Initiation

Directiveness of an initiation describes the qualitative expression of the communicative category 'ask to do' which can be 'direct' or 'indirect' (see this Chapter, Section 2.4: Communication; Directive Messages with Objects or about Objects, Acts and Events for definition of the category 'ask to do').

3. Analysis of the Video Data

For each pair, 5 minutes of interaction were selected for frame by frame analysis (Table 5.5), which equals a total corpus of 105 minutes for Study A and of 30 minutes for Study B (Table 5.6). As far as possible, the portion selected for analysis was the first 5 minutes which met the following criteria:

- it started from a point when the mother initiated an activity verbally and/or non-verbally, introducing a new kind of interactive event, a new play theme, a change of interest, etc
- a clear picture of the activities of both partners was present throughout the 5 minutes
- nobody else interrupted the play, affecting the communication by attempting to initiate an activity or responding to an activity
- the partners remained in the same room and only the toys provided for the study were used
- analysis was stopped at the completion of approximately 5 minutes when an event in the interaction was terminated.

In some cases it was not possible to select the first 5 minutes on the tapes for analysis because of the following reasons:

- during the filming of two dyads in Study A, one from the autistic and one from the developmentally-delayed group, the presence of a third person was unavoidable. This person was asked not to initiate any activity with the dyad but only to respond if the child addressed him
- some children, mainly from the autistic group, were moving around the room or leaving the room and it was difficult to always obtain a clear picture of their activities
- some children brought in their own toys or objects from the household
- sometimes an unexpected interruption happened, e.g. telephone call.

In these cases, analysis was carried out on the first 5 minutes which did meet the above criteria. Table 5.7 shows the duration of delay between the start of filming and the start of analysis.

Table 5.5: Duration of Analysis per Group (in minutes)

GROUPS	MEAN	STD. DEV.	RANGE
VERBAL AUTISTIC			
Mother	4.99	0.08	4.81-5.06
Child	4.99	0.09	4.80-5.06
DEVELOPMENTALLY-DELAYED			
Mother	5.03	0.03	5.01-5.10
Child	5.03	0.03	5.00-5.10
NON-DEVELOPMENTALLY-DELAYED			
Mother	5.00	0.03	4.93-5.01
Child	5.00	0.04	5.00-5.13
PRE-VERBAL AUTISTIC			
Mother	5.05	0.05	5.00-5.12
Child	5.05	0.42	5.00-5.11

Table 5.6: Total Duration of Behaviour Analysed per Group (in minutes)

GROUPS	CHILD	MOTHER
VERBAL AUTISTIC	34.95	34.92
DEVELOPMENTALLY-DELAYED	35.18	35.19
NON-DEVELOPMENTALLY-DELAYED	35.22	34.97
TOTAL TIME	105.35	105.08
PRE-VERBAL AUTISTIC	30.29	30.28

Table 5.7: Duration of Delay
between Start of Filming and Start of Analysis (in minutes)

GROUPS	MEAN	STD. DEV.	RANGE
VERBAL AUTISTIC	1.11	1.83	0.00-4.90
DEVELOPMENTALLY-DELAYED	0.91	1.65	0.00-4.54
NON-DEVELOPMENTALLY-DELAYED	0.14	0.11	0.02-0.32
PRE-VERBAL AUTISTIC	2.32	5.17	0.04-12.87

The videotapes were viewed with a Panasonic VHS AG-6200 industrial video recorder and a 20 Panasonic/Player VHS monitor TC-2000GM.

4. Condensed Coding System Used for Statistical Analysis and for Inter-observer Reliability

The full coding system presented before, was used for the video analysis and formed the basis of the statistical analysis. It seemed reasonable for the statistical analysis of the video data and for the calculation of the inter-observer reliability to collapse the relatively uninformative categories and their elements into larger functional types. Decisions about collapsing categories and applying statistical analysis were made after the data were examined in tables at a descriptive level. The categories were collapsed for the following reasons:

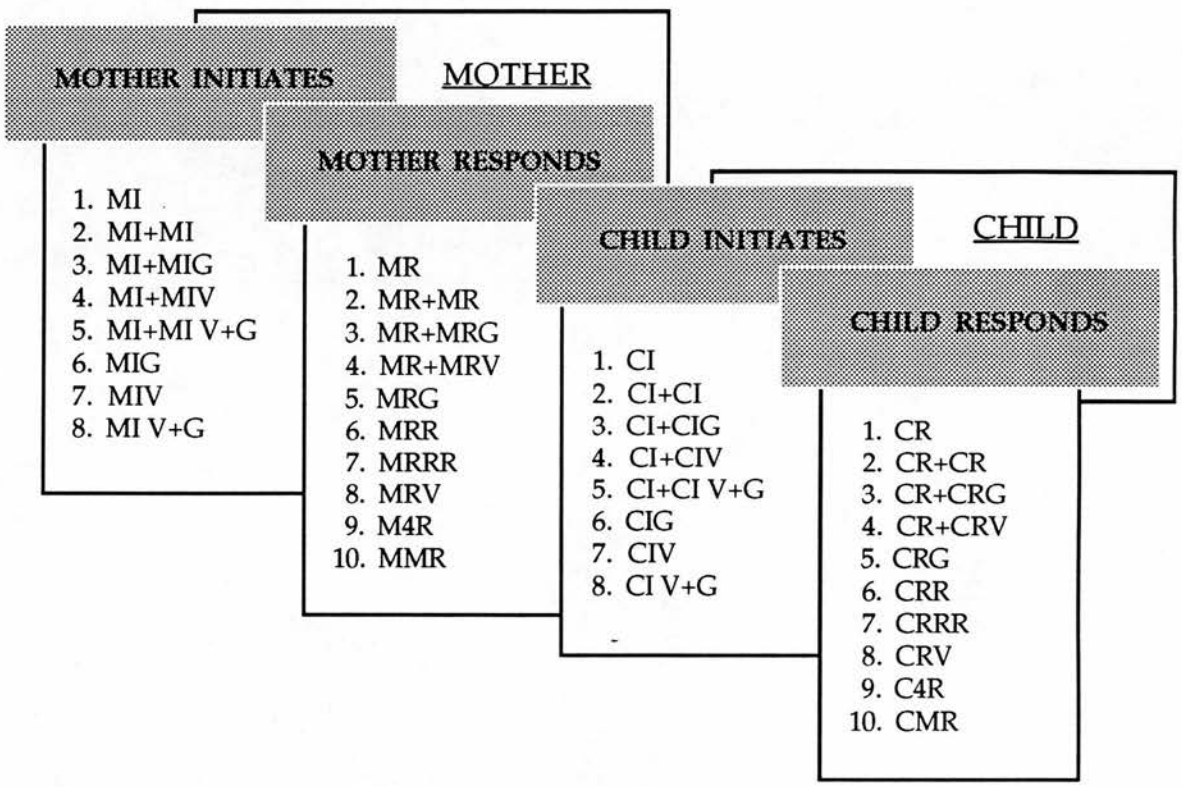
- to form functional sections
- to form larger categories acceptable for statistical analysis
- to address specific issues in each study.

The 6 categories in the function group 'Play' each comprised 45 elements (8 for 'mother initiates', 10 for 'mother responds', 8 for 'child initiates', 10 for 'child responds', 4 for 'mother initiates and responds', 4 for 'child initiates and responds' and 1 for 'other behaviours'). These 45 elements of each of the categories were collapsed into 7, to indicate 'mother initiates', 'child initiates', 'mother responds', 'child responds', 'mother initiates and responds', 'child initiates and responds' and 'other behaviours'. Statistical analysis was carried out for these 7 categories, but results are presented in tables only for the first 4 (Diagram 5.1.A) because the rest of the categories (Diagram 5.1.B) occurred very rarely. Additionally, all the behaviours shown by mothers and children were combined, inrespective of being initiations or responses (Diagram 5.1.A).

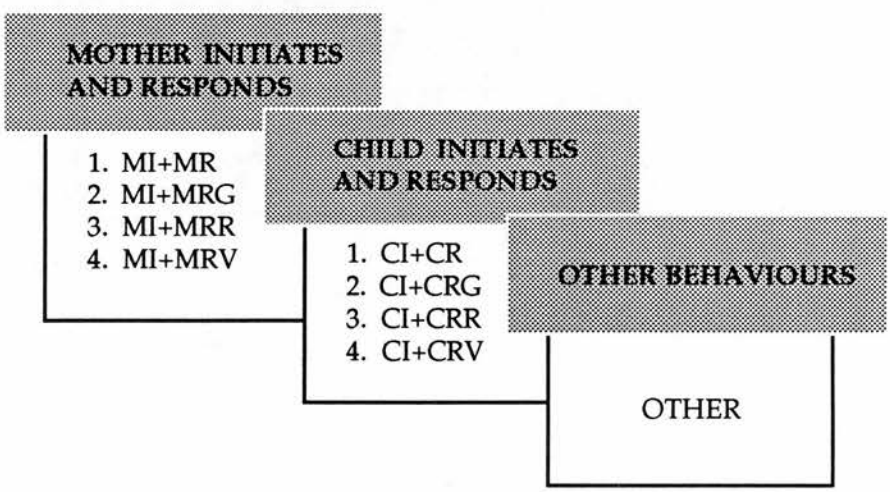
Table 5.2 (see this Chapter, Section 2: Full Coding System Used for Microanalysis) constructed for the abbreviations of the elements in the full coding system can be also used for the Diagrams of the condensed system.

Diagram 5.1: Reduced Coding System for 'Play'

A. Included in the Statistical Analysis



B. Excluded from the Statistical Analysis



The 6 levels of 'Interpersonal Engagement' and their subdivisions were collapsed into 4 levels (Diagram 5.2). Levels 1 and 2 became 'no communication' to define minimal contact between mother and child. Levels +3A, -3A, +4A and -4A became 'mother initiates' and Levels +3B, -3B, +4B and -4B became 'child initiates' when an attempt was made but there was, in fact, no interpersonal communication. Levels 5 and 6 were collapsed into 'communication' signifying maximal contact between mother and child. The levels 'no communication and 'communication' were coded for both mother and child. First, statistical analysis was carried out to examine the frequencies of these two levels regardless of who, the mother or the child, showed this behaviour. A second analysis was carried to find out if the mothers' or the children's style of engagement contributed to the significant differences.

The 7 'Focuses' of 'Joint Attention' became 6. 'Focus 2' and 'Focus 3' were collapsed to describe the use of more than one object when the other person was involved (Diagram 5.3).

28 out of the 30 categories in the function group 'Communication' each comprised of 21 elements (3 for 'mother initiates', 7 for 'mother responds', 3 for 'child initiates', 7 for 'child responds', and 1 for 'other behaviours'). These 21 elements of each of the 28 categories were collapsed into 3, to indicate who, 'mother' or 'child' made initiations and responses, and 'other behaviours'. Some categories of the function group 'Communication' on different occasions could be coded either as an initiation or as a response e.g. 'point out', others only as an initiation e.g. 'ask to do', and others only as a response e.g. 'positive reply'. The distinction between initiation and response was lost in the condensed system. Statistical analysis was carried out for these 3 categories, but results are presented in tables only for the first 2 (Diagram 5.4.A) because the category 'other behaviours' (Diagram 5.4.B) scarcely occurred.

Diagram 5.2: Reduced Coding System for 'Interpersonal Engagement'

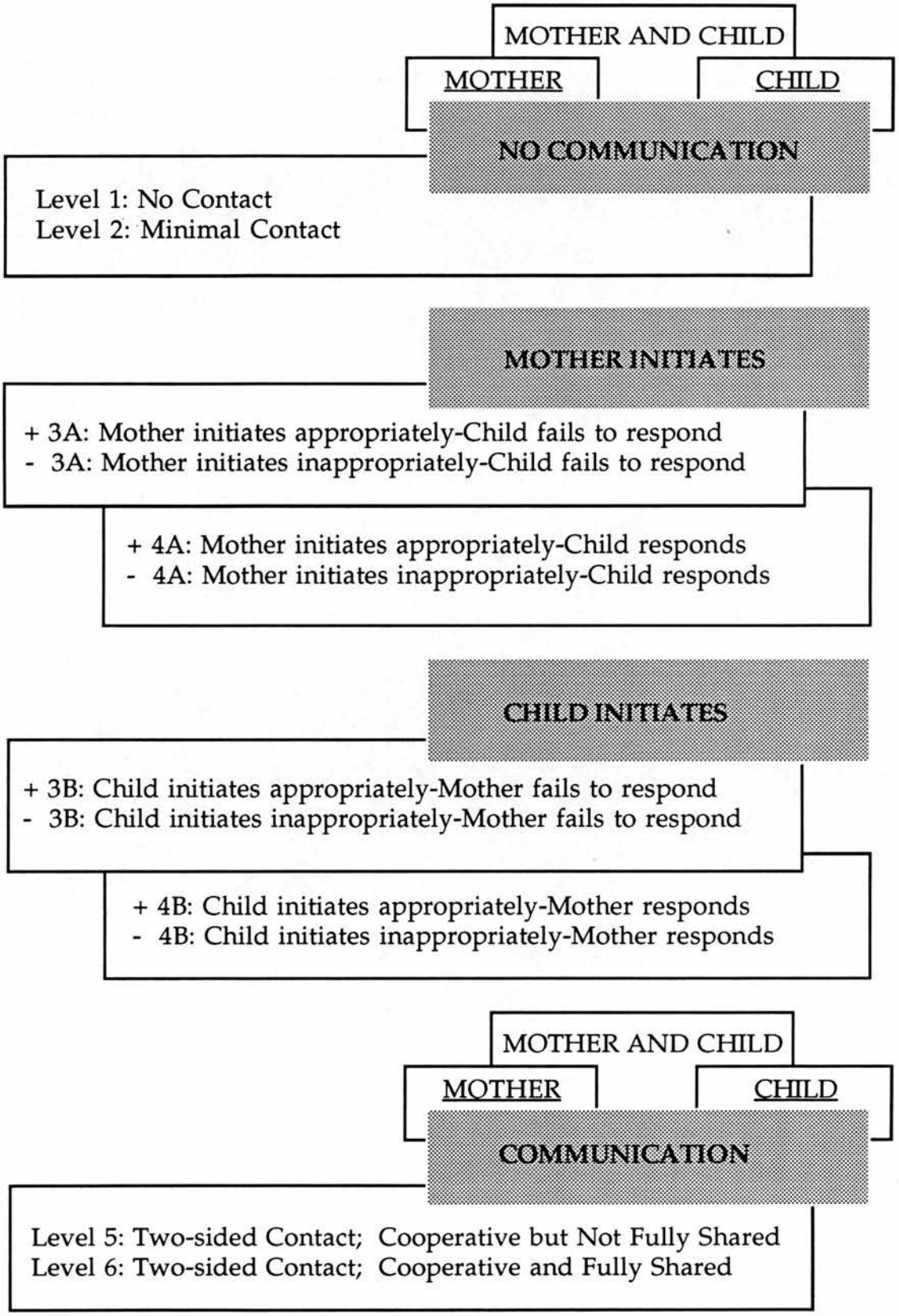


Diagram 5.3: Reduced Coding System for 'Joint Attention'

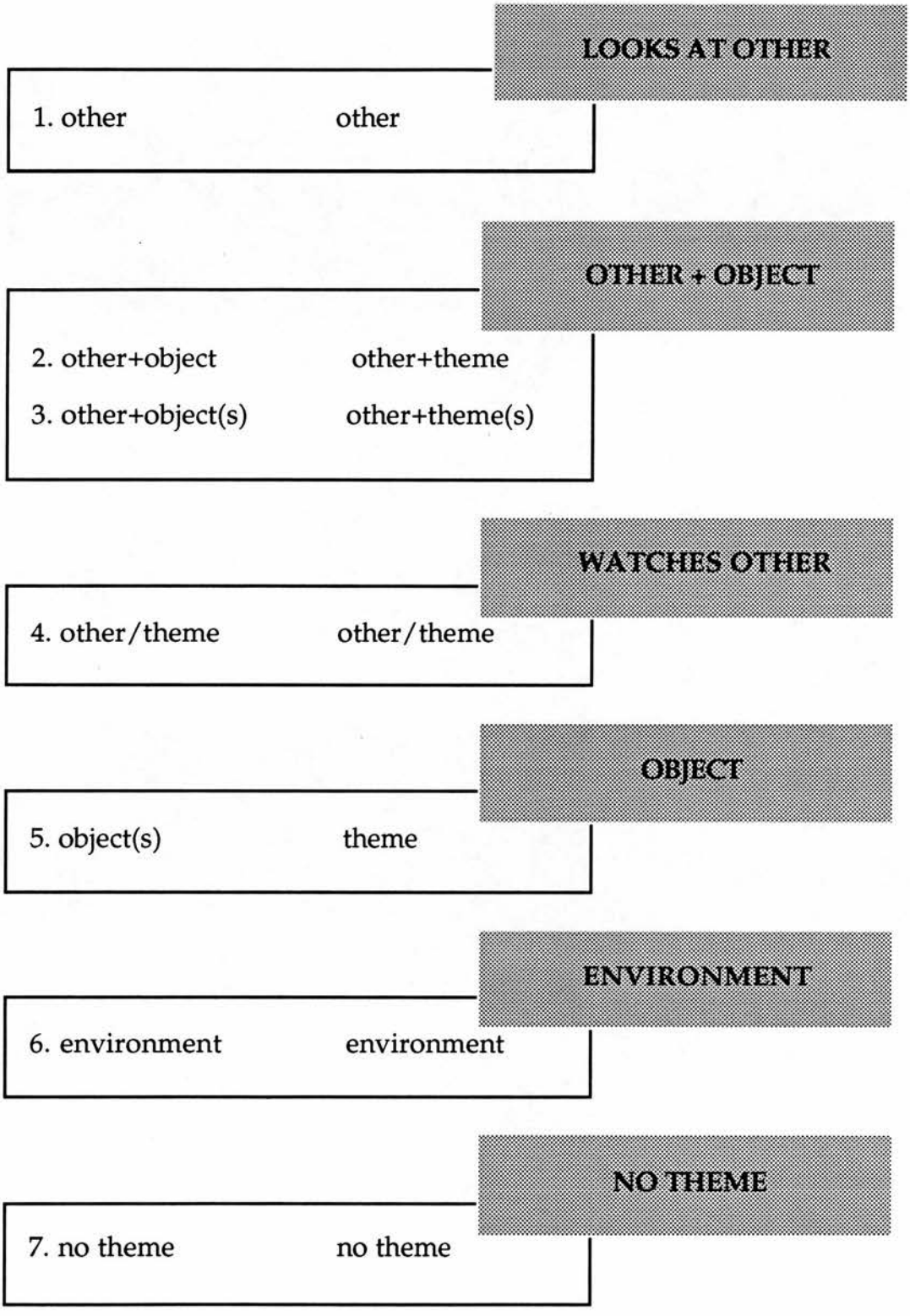
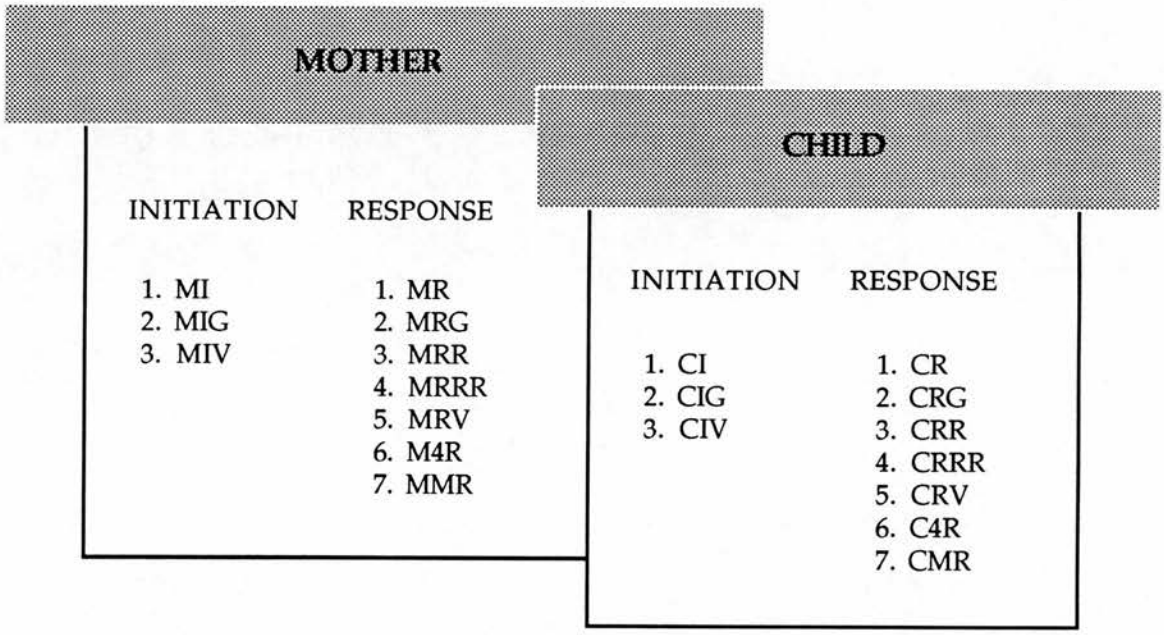
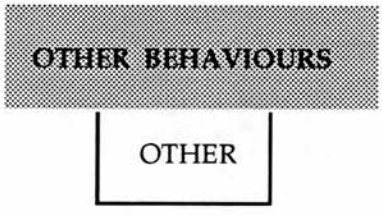


Diagram 5.4: Reduced Coding System for 'Communication'

A. Included in the Statistical Analysis



B. Excluded from the Statistical Analysis



The remaining 2 'Communication' categories 'eye contact + ' and 'eye contact * ' which were part of the section 'Interpersonal Messages' were examined separately because they comprised different elements. Thus, the categories 'eye checking', 'short eye contact', 'laugh or smile', 'other sub-verbal' and 'other non-verbal' appear in the statistical analysis under the heading 'Interpersonal Cues' and results on 'eye contact + or * ' are reported separately.

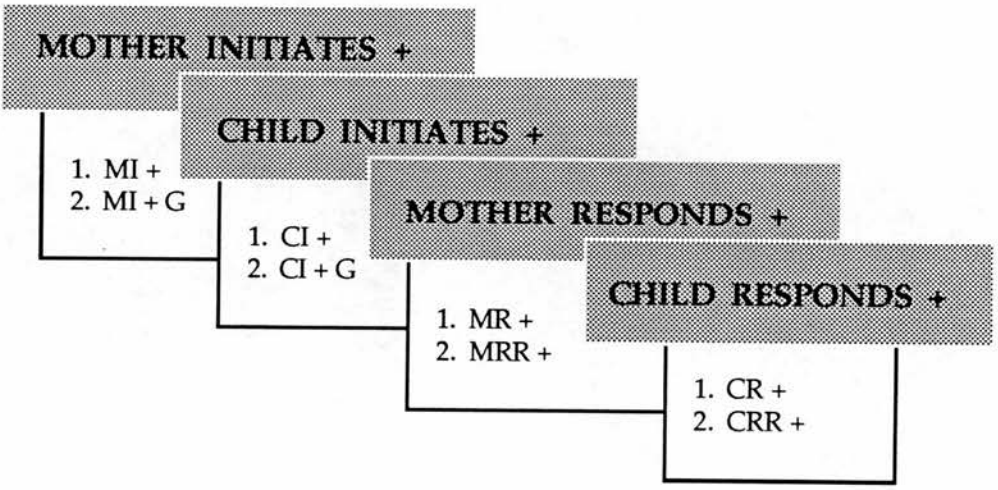
Each of these two categories for eye contact comprised 8 elements (2 for 'mother initiates', 2 for 'child initiates', 2 for 'mother responds', 2 for 'child responds' and 1 for 'other behaviours') (Diagram 5.5 and 5.6). These 8 elements were collapsed into 5 to indicate 'mother initiates', 'child initiates', 'mother responds', 'child responds' and 'other behaviours'. Results are presented only for the first 4 (Diagram 5.5.A and 5.6.A) because 'other behaviours' did not yield any scores (Diagram 5.5.B and 5.6.B).

The 'Initiatives' have been classified into 'unclear' or 'unintelligible' for an initiation, and 'unclear', 'unintelligible', 'tight' or 'loose' for a response. For the statistical analysis, initiations and responses have been collapsed for the categories 'unclear' and 'unintelligible'. Only responses can be, by definition, 'tight' or 'loose'. The category of 'Directiveness' has been also listed to define the communicative category 'ask to do' (Diagram 5.7).

Sometimes it was important to develop an overall picture of the behaviours in the interaction in addition to the analysis of the specific 'Play' categories in which these behaviours appeared. Thus, the play categories were examined separately but they were also combined to form the category 'Total' play. The aim was to facilitate the interpretation of the results in 'Interpersonal Engagement', 'Joint Attention' and 'Certainty' of Initiatives (Diagram 5.8).

Diagram 5.5: Reduced Coding System for 'Eye Contact + '

A. Included in the Statistical Analysis



B. Excluded from the Statistical Analysis

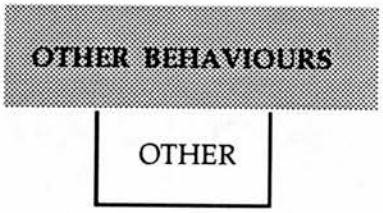
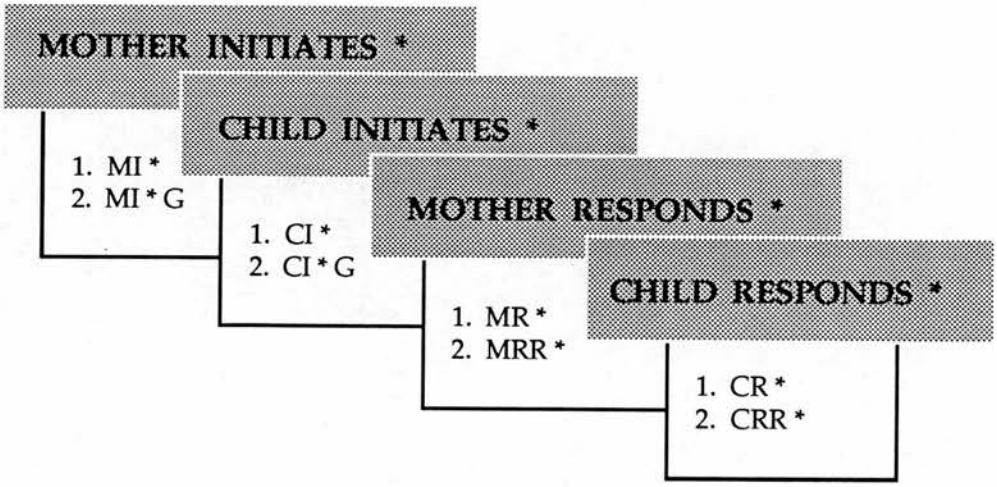


Diagram 5.6: Reduced Coding System for 'Eye Contact * '

A. Included in the Statistical Analysis



B. Excluded from the Statistical Analysis

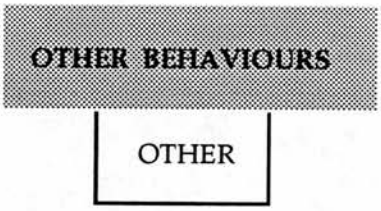


Diagram 5.7: Reduced Coding System for 'Initiatives'

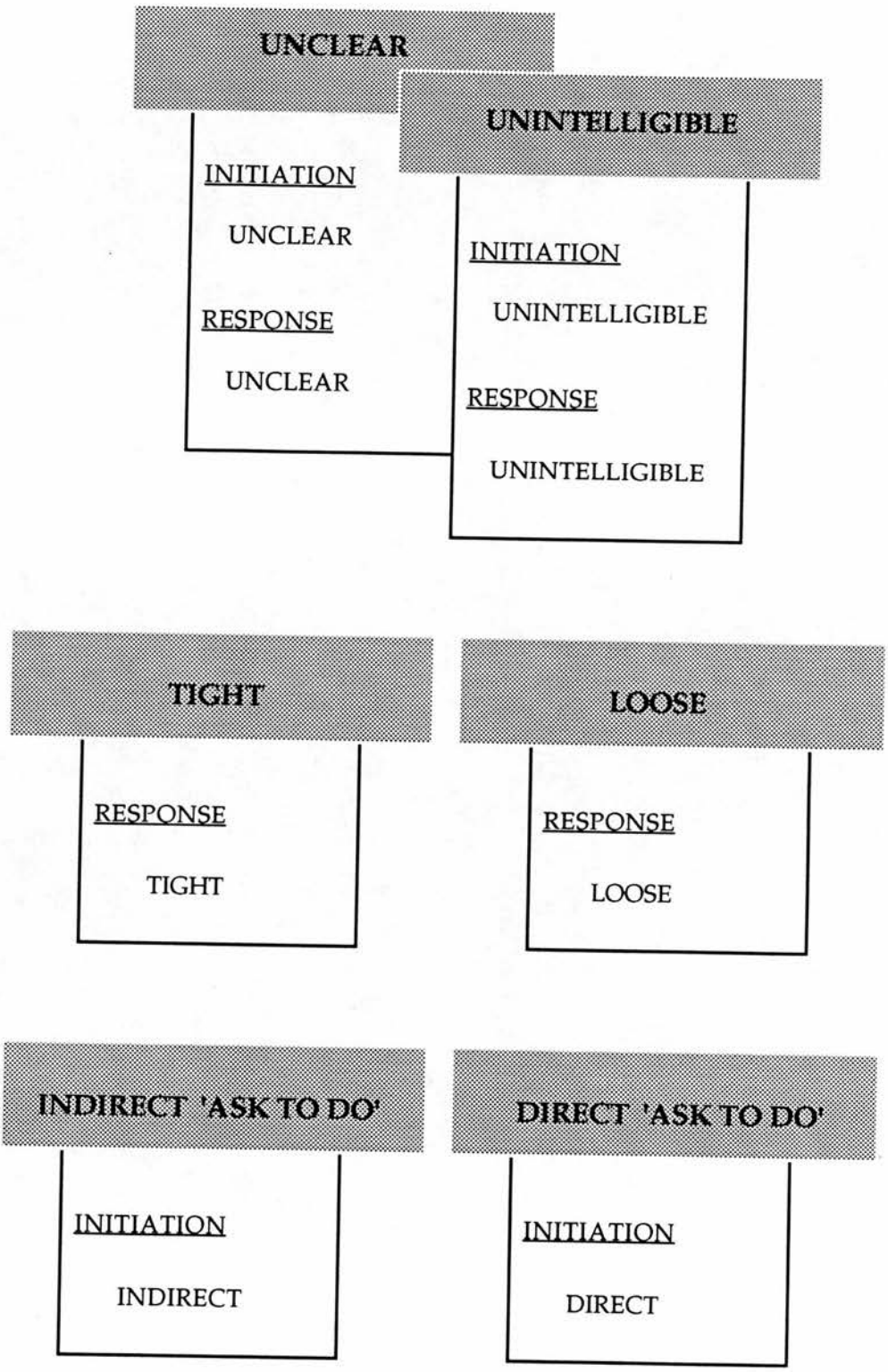


Diagram 5.8: Reduced Coding System for 'Total' Play applied in 'Interpersonal Engagement', 'Joint Attention' and 'Certainty' of Initiatives

5. Inter-observer Reliability

In order to obtain measures of inter-observer reliability, a second observer was trained in use of the coding scheme and then coded a sample of the data independently.

The second observer had had no previous experience of video microanalysis. She was blind to the diagnosis of the children. In the beginning she was trained for recording onset and offset times, and categories of 'Play', 'Joint Attention', 'Communication' and 'Initiatives'. When the inter-observer reliability for these sections was completed, then she was trained how to record the levels of 'Interpersonal Engagement'. However, her training for all sections of the coding scheme involved five stages:

1) the study and the coding scheme were introduced
2) the analysis of five minutes from each of three tapes (one per group) from Study A was briefly demonstrated in order to familiarize her with the procedures of the behaviour coding
3) the descriptions of the various categories were learnt
4) the analysis of one minute from each of three tapes (one per group which are different from the ones used in stage 2) from Study A was explained comprehensively and exhaustively in order to train the independent rater
5) the rater coded another three tapes of one minute duration (one per group) on her own to establish that the training had been successful.

Then, the second observer coded a sample of the data independently. From the 21 dyads of Study A twelve dyads were randomly selected, four dyads per group, and from the 6 dyads in Study B three dyads were also randomly selected. Inter-observer reliability was calculated for each of the fifteen subjects from a randomly selected one minute interaction taken from the five minutes sample (totally 15 minutes which is 11% of the total video corpus subjected to microanalysis). Although the portions were selected randomly, it was confirmed that each one included the beginning and the end of every interactive event noted.

It is difficult to establish high inter-observer agreement when a complex coding system is used. This is due to the increased attention demands on the rater and also to the multiple messages sent in a complex interaction by the participants (Bakeman and Gottman, 1986). Common errors result from failing to record a category, from miscoding a category or from coding a category because something is expected to happen. It is more difficult to establish reliability when sequential analysis is applied because any disagreement can result in lack of synchrony, and therefore no subsequent comparisons match (Hollenbeck, 1978).

Inter-observer reliability in the present study was estimated with Cohen's Kappa statistic. Scores obtained for each category of the condensed coding system ranged from .60 to .99. The mean value of k for all categories was .89. In more detail, the value of kappa was as follows: 'exploratory play' (.95), 'combinatorial play' (.99), 'instrumental play' (.95), 'symbolic play' (.94), 'ambiguous play' (.99), 'minimal play' (.99), 'cooperative

messages' (.99), 'directive messages' (.99), 'initiative in messages' (.93), 'reaction to messages' (.92), 'interpersonal cues' (.90), 'off-task behaviours' (.99), 'eye contact' (.74), 'levels of engagement' (.60), 'joint attention' (.65), 'certainty of initiatives' (.73) and 'directiveness of 'ask to do' (.99).

It was not always possible to obtain a Kappa value when individual categories were used because the number of non-empty rows or columns was one due to the low frequency of the specific categories. Therefore, the Cohen's Kappa statistic was applied for functional groups of categories calculated for mother and child (e.g. the Kappa value of the functional group 'Cooperative messages' is reported because for the categories 'display' and 'demonstrate' the number of rows and columns obtained was one). An example is given of how Cohen's Kappa was calculated for 'exploratory play' with the SPSS statistical package.

		2nd Observer		
	Col Pct	MOTHER	CHILD	Row Total
		1	2	
1st Observer				
MOTHER	1	97.7	2.4	349 62.5
CHILD	2	2.3	97.6	209 37.5
	Column Total	352 63.1	206 36.9	558 100.0

Statistic	Value	ASE1	T-value	Approximate Significance
Kappa	.95013	.01367	22.44551	

Number of Missing Observations: 0

CHAPTER 6 RESULTS FROM THE CONDENSED SYSTEM OF THE VIDEO DATA

1. STEPS FOLLOWED FOR THE STATISTICAL ANALYSIS OF STUDY A AND STUDY B

The issues addressed in Studies A and B concern differences in the frequency of 'play', 'interpersonal engagement', 'joint attention' and 'communication' of mothers and children between groups. These provide a structure for presentation of the results. Tables of results give information on the behaviours of mothers and children with comments on the most important findings. The most significant results are presented in summary tables.

The data from the coding sheets were entered in StatView II (1987) and were translated to the Statistical Package for Social Sciences for carrying out the statistical analysis (SPSS, 1990).

Coded occurrences of play and communication were analysed by two non-parametric tests: Kruskal-Wallis one-way analysis of variance and Mann-Whitney, both expressed as probabilities (p values). Non-parametric tests were used when the data were not normally distributed. Occurrences of 'Joint Attention' and 'Interpersonal Engagement' were tested by analysis of variance (ANOVA), and the F value and the degrees of freedom (df) are reported.

The Kruskal-Wallis one-way analysis of variance (K-W) was used to detect differences between the three groups in Study A. The Mann-Whitney test (M-W) was used to examine any pair-wise differences between groups: verbal autistic versus delayed, verbal autistic versus non-delayed, delayed versus non-delayed. The Mann-Whitney was also used in Study B to test for differences between verbal and pre-verbal autistic children. ANOVAs were used in both studies, but *post hoc* comparisons of the Newman-Keuls test were applied only in Study A to identify inter-group differences.

One has to be cautious about the interpretation of results based on the above mentioned statistical tests because of the low frequency of some categories and because some differences may be significant merely by chance when multiple comparisons are made.

The abbreviations used in the text and the tables of this chapter are as follows:

AV	Verbal Autistic Children
APV	Pre-verbal Autistic Children
DD	Developmentally-Delayed Children
ND	Non-Developmentally-Delayed Children
K-W	Kruskal-Wallis one way analysis of variance
M-W	Mann-Whitney test
ANOVA	Analysis of Variance
χ^2	SPSS output reports χ^2 values instead of H values for Kruskal-Wallis one way analysis of variance
*	significant at 0.05 level ($p \leq 0.05$)
**	significant at 0.01 level ($p \leq 0.01$)
***	significant at 0.001 level ($p \leq 0.001$)
AV/DD, AV/ND, DD/ND p values or *post hoc* comparisons	comparisons between the first group and the second group, which are distinguished by a slash
AV/DD, AV/ND, DD/ND more or less	'more' or 'less' indicates the relation of the first group to the second group. The two groups are distinguished by a slash.

2. Study A: Results from the Comparison of Verbal Autistic, Developmentally-Delayed and Non-Delayed Groups

2.1. Play

Mothers of verbal autistic (AV) children showed 'exploratory', 'combinatorial', 'instrumental', 'symbolic', 'ambiguous' and 'minimal' play as frequently as mothers of developmentally-delayed (DD) and non-delayed (ND) children (Table 6.1).

Verbal autistic children showed 'combinatorial', 'instrumental', 'symbolic' and 'ambiguous' play as frequently as delayed and non-delayed children, but they showed less 'exploratory' play (x^2=6.97, p≤0.05) especially in comparison with the ND children (U=6, p≤0.05). There was also a group difference in the occurrence of 'minimal' play (x^2=6.37, p≤0.05). Delayed children showed more 'minimal' play than ND children (U=5, p≤0.01) (Table 6.1).

Mothers of verbal autistic children initiated 'exploratory', 'combinatorial', 'instrumental', 'symbolic', 'ambiguous' and 'minimal' play as frequently as mothers of delayed and non-delayed children (Table 6.2). Although mothers of AV children initiated 'exploratory' play as much as mothers in the DD and ND groups, they responded less to their children's initiations (x^2=13.44, p≤0.001) than mothers of DD children (U=3, p≤0.01) and ND children (U=0.0, p≤0.001) (Table 6.3). We can assume that this might be due to the fact that AV children initiated less 'exploratory' play (Table 6.2), which led their mothers to respond less. Mothers of DD children responded more than mothers of ND children in 'minimal' play (U=6, p≤0.01) (Table 6.3).

Although verbal autistic children initiated 'combinatorial', 'instrumental', 'symbolic' and 'ambiguous' play as frequently as delayed and non-delayed children, they initiated less 'exploratory' play (x^2=6.90, p≤0.05) in comparison with the DD (U=8, p≤0.05) and the ND children (U=7, p≤0.05). Verbal autistic children responded less than ND children in 'exploratory' play (U=9, p≤0.05) (Table 6.3). They also responded less than DD children in 'minimal' play (U=8.5, p≤0.05) (Table 6.3). Developmentally-delayed children initiated more 'ambiguous' (U=9.5, p≤0.05) and more 'minimal' play than the ND children (U=8, p≤0.05) (Table 6.2).

Table 6.1: Frequencies of Play Activities shown by Mothers and Children

	MOTHER							CHILD						
PLAY	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
exploratory														
median	148	116	148	.27	.16	.90	.18	69	92	112	**.03***	.08	**.02***	.18
range	85-220	68-174	92-217					46-143	74-133	85-166				
combinatorial														
median	13	17	21	.48	.25	.37	.90	5	8	5	.45	.25	.75	.34
range	7-25	4-72	7-32					0-12	0-25	2-17				
instrumental														
median	51	56	43	.81	.61	.70	.61	67	73	62	.27	.61	.22	.14
range	31-103	33-95	14-104					17-102	22-102	15-88				
symbolic														
median	41	37	42	.67	.41	.49	.95	23	22	14	.73	.65	.56	.52
range	21-71	21-55	15-64					9-40	5-57	5-48				
ambiguous														
median	10	5	4	.40	.18	.34	.70	9	10	3	.24	.48	.18	.16
range	5-17	4-15	1-21					3-15	2-26	2-24				
minimal														
median	19	20	12	.32	.61	.12	.40	12	21	8	**.04***	.08	.70	**.01****
range	13-37	7-46	3-32					1-39	10-53	1-20				

Table 6.2: Frequencies of Initiations in Play shown by Mothers and Children

	MOTHER INITIATES							CHILD INITIATES						
PLAY	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
exploratory														
median	141	107	133	.23	.08	.65	.28	55	77	93	**.03***	**.03***	**.02***	.34
range	83-204	64-157	81-187					35-117	60-113	62-127				
combinatorial														
median	13	15	18	.71	.48	.48	.95	0	8	3	.64	.37	1	.48
range	7-25	4-72	5-31					0-2	0-25	2-17				
instrumental														
median	39	51	41	.86	.80	.65	.65	48	58	47	.48	.80	.34	.28
range	23-97	25-80	12-94					13-91	8-97	9-62				
symbolic														
median	31	19	25	.27	.14	.41	.31	17	11	4	.19	.90	.10	.14
range	17-56	10-35	13-55					5-36	5-36	2-28				
ambiguous														
median	8	4	3	.31	.11	.30	.80	6	10	2	.11	.48	.12	**.05***
range	5-15	2-12	0-16					2-14	2-21	1-15				
minimal														
median	17	8	9	.34	.18	.28	.65	7	16	7	.11	.25	.40	**.03***
range	6-32	4-39	2-27					1-35	4-49	1-14				

Table 6.3: Frequencies of Responses in Play shown by Mothers and Children

	MOTHER RESPONDS							CHILD RESPONDS						
PLAY	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
exploratory														
median	2	8	10	**.001*** **	**.005** **	**.001*** **	.08	12	17	21	.14	.40	**.05***	.28
range	0-7	3-12	8-18					7-19	2-25	10-37				
combinatorial														
median	0	0	1	.28	.23	.12	.3	0	0	0	.35	.32	.14	.59
range	0-0	0-3	0-5					0-0	0-4	0-4				
instrumental														
median	6	8	7	.75	.56	.95	.48	8	12	7	.63	.33	.56	.75
range	2-12	1-19	2-15					4-19	5-18	5-23				
symbolic														
median	11	11	8	.51	1	.28	.36	5	9	6	.56	.22	.61	.85
range	4-23	2-38	1-18					2-10	0-27	2-21				
ambiguous														
median	2	2	1	.80	.89	.60	.54	1	1	2	.88	.95	.60	.74
range	0-3	1-4	0-6					0-4	0-5	0-9				
minimal														
median	5	6	4	.06	.32	.19	**.02***	1	4	3	.08	**.04***	.33	.14
range	1-7	3-17	1-5					0-6	2-6	0-6				

2.2. Interpersonal Engagement

The results in the previous section did not reveal important differences in play between verbal autistic , developmentally-delayed and non-delayed groups. However, when occurrences of play in a communicative context of shared and balanced experiences are looked at, significant differences appear (Table 6.4 and Table 6.5).

In all, verbal autistic children and their mothers produced more acts in 'no communication' ($F_{(2,18)}=3.57$, $p\leq0.05$) and fewer acts in 'communication' ($F_{(2,18)}=3.71$, $p\leq0.05$). *Post hoc* comparisons indicated that verbal autistic children and their mothers were engaged more in 'no communication' and less in 'communication' than the non-delayed group (Table 6.4). It seems that the significant differences at the level of 'communication' ($F_{(2,18)}=5.27$, $p\leq0.01$) and 'no communication' ($F_{(2,18)}=4.45$, $p\leq0.05$) are due to the way that AV children express themselves. Follow-up comparisons showed that AV children acted more frequently in 'no communication' than ND children and less often in 'communication' compared to DD and ND children (Table 6.5). On the other hand, mothers of AV children initiated significantly less in the context of interpersonal play ($F_{(2,18)}=17.12$, $p\leq0.001$). Follow-up comparisons indicated that mothers of AV children showed this behaviour more than mothers of DD and ND children (Table 6.4).

In 'exploratory' play, verbal autistic children and their mothers were engaged less in 'communication' ($F_{(2,18)}=3.52$, $p\leq0.05$) and mothers more often initiated when there was no contact ($F_{(2,18)}=8.61$, $p\leq0.01$) (Table 6.4). Subsequent analyses showed that the AV group was involved more in 'no communication' and less in 'communication' than the ND group. Examining if the differences are due to mothers' or children's behaviours, it was found that mothers of AV children acted more in 'no communication' ($F_{(2,18)}=5.34$, $p\leq0.01$) but AV children acted less in 'communication' ($F_{(2,18)}=9.44$, $p\leq0.01$) (Table 6.5). Mothers of AV children initiated significantly more in the category 'mother initiates' than mothers of DD and ND (Table 6.4).

In 'combinatorial' play, no differences were found for any level of engagement (Table 6.4 and Table 6.5)

In 'instrumental' and 'symbolic' play, no differences were found for the levels 'no communication' and 'communication' (Table 6.4 and Table 6.5). However, there was a significant group effect for the level 'mother initiates' in 'instrumental' play ($F_{(2,18)}=10.60$, $p\leq0.001$) and in 'symbolic' play ($F_{(2,18)}=5.22$, $p\leq0.01$). Subsequent comparisons showed that mothers of the AV group showed more of this behaviour than mothers of the DD and the ND group (Table 6.4).

In 'ambiguous' play, no differences were found apart from the level 'mother initiates' ($F_{(2,18)}=3.55$, $p\leq0.05$) (Table 6.4).

In 'minimal' play, there was a significant group effect for the level 'no communication' ($F_{(2,18)}=7.81$, $p\leq0.01$). The AV group was involved in 'no communication' more often than the other two groups (Table 6.5). This effect was present both for mothers ($F_{(2,18)}=3.33$, $p\leq0.05$) and their children ($F_{(2,18)}=3.45$, $p\leq0.05$) (Table 6.4). Follow-up analyses revealed that mothers of AV children were not in communication with their children as frequently as mothers of the DD group. Verbal autistic children were less often engaged in communication than the ND children (Table 6.5). There was a group effect for the level 'mother initiates' ($F_{(2,18)}=4.47$, $p\leq0.05$). Mothers of AV children showed this kind of behaviour more than mothers of the other two groups (Table 6.4).

Table 6.4: Mean Frequencies of Levels of Engagement shown by Mothers and Children

	MOTHER AND CHILD						
LEVELS DURING PLAY	AV	DD	ND	F (df=2,18)	Newman-Keuls comparisons Significant at 0.05 level		
					AV/DD	AV/ND	DD/ND
total play							
no communication	91.71	59.14	40.74	**3.57***		*	
communication	243.86	330.14	353.68	**3.71***		*	
mother initiates	46.86	13	14.72	**17.12*****	*	*	
child initiates	12	7.14	6.43	1.80			
exploratory play							
no communication	49.57	26	26.86	3.07		*	
communication	150.14	181.71	235.29	**3.52***		*	
mother initiates	24.29	7	8.86	**8.61****	*	*	
child initiates	4.29	3.86	4.57	.05			
combinatorial play							
no communication	8.43	13.43	5.43	1.20			
communication	10.29	21.57	20.14	2.55			
mother initiates	1.57	0.86	0.57	1.27			
child initiates	0.14	0.14	0.14	.00			
instumental play							
no communication	21.57	19.14	6.71	2.43			
communication	81.14	105	88.57	.56			
mother initiates	14.43	2.43	3.86	**10.60*****	*	*	
child initiates	6.43	2.29	1.29	2.69			
symbolic play							
no communication	7.14	3.43	2.14	1.35			
communication	45.29	54.29	51.41	.31			
mother initiates	13.43	4.29	3.87	**5.22****	*	*	
child initiates	2	1.29	1	.41			
ambiguous play							
no communication	6.43	2.14	1.57	2.68			
communication	9.86	16.86	12.86	.88			
mother initiates	2.71	0.57	0.86	**3.55***		*	
child initiates	0.57	0.29	0.14	.39			
minimal play							
no communication	8.43	3.86	2	**7.81****	*	*	
communication	22.43	37.71	22.14	1.40			
mother initiates	4.71	1.14	0.29	**4.47***	*	*	
child initiates	0.43	0.14	0.14	2.17			

Table 6.5: Mean Frequencies of Levels of Engagement shown separately by Mothers and Children

	MOTHER						CHILD					
LEVELS DURING PLAY	AV	DD	ND	F (df=2,18)	Newman-Keuls comparisons significant at 0.05 level AV/DD	AV/ND DD/ND	AV	DD	ND	F(2,18)	Newman-Keuls comparisons significant at 0.05 level AV/DD	AV/ND DD/ND
total play												
no communication	39.86	27.87	18.73	2.38			51.63	31	21.94	**4.45***		*
communication	147.57	171.41	200.97	2.58			95.53	156.99	151.31	**5.27****	*	*
exploratory play												
no communication	21.86	11.58	9.71	**5.34****	*	*	27.76	14.13	17.23	1.48		
communication	105.86	101.56	136.57	1.66			44.49	80.42	99.02	**9.44****	*	*
combinatorial play												
no communication	6.86	10.29	4.57	.94			1.83	3.67	0.86	1.61		
communication	6.86	14.29	14.57	2.56			4	8.50	5.57	1.59		
instrumental play												
no communication	6.57	6.29	3.57	.57			15.03	12.86	3.15	3.06		
communication	36.86	49.71	46.14	.44			44.53	55.43	42.56	.55		
symbolic play												
no communication	3.14	1.14	1.57	1.30			4	2.29	0.57	1.11		
communication	29	31	31.98	1			16.29	23.43	29.64	.50		
ambiguous play												
no communication	2.14	0.29	0.29	2.28			4.29	1.86	1.29	2.46		
communication	6	7.14	7.43	.14			3.86	9.71	5.43	2.07		
minimal play												
no communication	3.14	1.29	1.14	**3.33***	*		5.29	2.27	0.86	**3.45***		*
communication	14.43	17.57	14	.25			12.10	20.14	8.14	2.91		

2.3. Joint Attention

Overall, there were almost no significant inter-group differences in joint attention between mothers and their children (Tables 6.6 and 6.7). Mothers and children in the verbal autistic group generally looked at each other, watched each other, shared an object and used an object as frequently as in the developmentally-delayed and the non-delayed groups. In 'minimal' play, mothers of AV children 'watched' their children more ($F_{(2,18)}=4.76$, $p\leq0.05$) than mothers of DD and ND children, which was confirmed by *post hoc* comparisons (Table 6.6). In 'exploratory' play, where the sub-category of social exploration is defined as 'watching partner's activities', a main group effect was found ($F_{(2,18)}=3.54$, $p\leq0.05$). Verbal autistic children watched their mothers significantly less than non-delayed children. *Post hoc* analyses showed that they also used fewer object-directed behaviours than ND children (Table 6.7). In 'minimal' play a group effect was found for the category 'mother+object' ($F_{(2,18)}=3.41$, $p\leq0.05$) (Table 6.7). It seems that DD children used more 'objects involving their mothers' than AV and ND children.

Table 6.6: Mean Frequencies of Joint Attention Behaviours shown by Mothers

JOINT ATTENTION DURING PLAY	AV	DD	ND	F (df=2,18)	Newman-Keuls comparisons Significant at 0.05 level AV/DD	AV/ND	DD/ND
total play							
looks at child	4.57	8.43	5.29	.45			
child+object	73.29	42.57	62	1.26			
watches child	111.71	99.71	97.57	.24			
object	225.12	205.52	230.74	1			
environment	4.71	5.12	1.03	.699			
no theme	1.21	2.09	3.88	.404			
exploratory play							
looks at child	1.29	1.71	1.29	.01			
child+object	46.57	25	44.43	1.66			
watches child	82.71	66.57	73	.58			
object	146.69	114.68	156.01	1.95			
environment	4.27	5.32	1.37	.37			
no theme	0.29	0	0.14	.60			
combinatorial play							
looks at child	0	0	0.14	1			
child+object	3.57	3.86	4.71	.15			
watches child	2.29	4.43	2.43	.31			
object	15.67	30.50	19.71	1.13			
environment	0	0	0	-			
no theme	0	0	0	-			
instrumental play							
looks at child	0.29	1.71	0.57	1.11			
child+object	29	17.29	17.14	.89			
watches child	18.43	23.86	13.29	.48			
object	59.80	62.06	59.45	.01			
environment	0	0.61	0	.91			
no theme	0	0	0.29	.90			
symbolic play							
looks at child	1.43	2.43	0.29	2.10			
child+object	13.14	5.43	9.43	2.81			
watches child	23	16.14	16.86	.86			
object	47.50	36.29	38.62	.82			
environment	0	0	0	-			
no theme	0	0	0.14	1			
ambiguous play							
looks at child	0.43	0	0.71	1.24			
child+object	3.29	1.71	2	.86			
watches child	4.14	3	2.29	.97			
object	9.80	5.20	11.60	1.44			
environment	0	0	0	-			
no theme	0	2.2	3.2	.54			
minimal play							
looks at child	1.71	4.71	3.14	.63			
child+object	7.14	5.57	3.29	.63			
watches child	10.71	5.43	4.57	**4.76***	*		*
object	19.87	15.26	16.75	.72			
environment	0.65	3.43	0	1.24			
no theme	0.14	0.14	0.29	1.29			

Table 6.7: Mean Frequencies of Joint Attention Behaviours shown by Children

JOINT ATTENTION DURING PLAY	AV	DD	ND	F (df=2,18)	Newman-Keuls comparisons Significant at 0.05 level AV/DD	AV/ND	DD/ND
total play							
looks at mother	4	8.86	4.71	.67			
mother+object	62.29	66.86	63.43	.03			
watches mother	15	25.57	29.86	2.56			
object	148.73	179.44	169.15	1.09			
environment	6.96	14.51	8.05	.90			
no theme	1.04	2.37	3.16	.83			
exploratory play							
looks at mother	2.86	3.71	2.57	.11			
mother+object	32.57	35.43	42.57	.40			
watches mother	12.71	18.71	25.86	**3.54***			*
object	74.04	92.32	114.06	3.30			*
environment	2.01	6.25	6.17	1.09			
no theme	0	0.52	0.62	.66			
combinatorial play							
looks at mother	0	0	0	-			
mother+object	4.86	4.57	3.29	.19			
watches mother	0	2.43	2.43	1.50			
object	9	12.80	7.33	.83			
environment	0	1	0	.88			
no theme	0	0	0	-			
instrumental play							
looks at mother	0.43	0.43	1.14	.32			
mother+object	21.71	20.71	19.29	.04			
watches mother	1.29	3.43	1	.95			
object	73.34	68.97	47	1.71			
environment	0.62	1.46	0	.95			
no theme	0.14	0	0	1			
symbolic play							
looks at mother	0	1.71	0.57	2.33			
mother+object	10.71	10.29	8.29	.13			
watches mother	1.43	2.71	1.71	.44			
object	23.89	28.28	21.68	.25			
environment	0	2.39	2.32	1.45			
no theme	0	0	0.44	2.49			
ambiguous play							
looks at mother	0.29	0.43	0	.84			
mother+object	3.14	3.14	1.57	.80			
watches mother	0.57	1.71	1.29	2.52			
object	7.81	10.90	7.68	.41			
environment	0.97	0.57	0	.93			
no theme	0.57	0.14	0.43	.40			
minimal play							
looks at mother	0.86	3.29	0.71	.68			
mother+object	4.29	9.14	3	**3.41***			
watches mother	0.86	1.86	1.29	.96			
object	11.16	18.34	7.83	1.01			
environment	2.93	4.16	1.67	.49			
no theme	0.86	0.43	0.86	.39			

2.4. Communication

Cooperative Messages

No great differences were found in the use of Cooperative Messages (Table 6.8). Mothers of verbal autistic children 'accepted an object' from their children less frequently than mothers of non-delayed children ($U=9.5$, $p\leq0.05$). There was a significant group effect found in the frequencies that mothers 'requested an object' from their children ($x^2=7.67$, $p\leq0.05$). Mothers of delayed children did not 'request an object' from their children as frequently as mothers of AV children ($U=0.0$, $p\leq0.01$) and ND ($U=2.5$, $p\leq0.05$). Mothers of AV children 'displayed an object' more than mothers of non-delayed children ($U=6.5$, $p\leq0.05$). Verbal autistic children 'requested an object' less than DD children ($U=1.5$, $p\leq0.05$). Delayed children 'demonstrated an object' more than ND children ($U=0.0$, $p\leq0.05$).

Directive Messages

Mothers of verbal autistic children used more Directive Messages than mothers of delayed children ($U=9$, $p\leq0.05$), but verbal autistic children used Directive Messages as frequently as delayed and non-delayed children (Table 6.9). Mothers of AV children 'asked their children to do' something more frequently than mothers of DD children ($U=6$, $p\leq0.01$). For the children, there was a group effect found in 'pointing out' ($x^2=11.60$, $p\leq0.01$), in using an 'attract marker' ($x^2=9.29$, $p\leq0.001$), 'asking the mother to do something' ($x^2=5.81$, $p\leq0.05$) and 'taking an object' from the mother ($x^2=6.19$, $p\leq0.05$). AV children did not 'point out' at all in comparison with DD ($U=4.5$, $p\leq0.01$) and ND children ($U=0.0$, $p\leq0.001$). Delayed children used an 'attract marker' more frequently than AV ($U=7$, $p\leq0.01$) and ND children ($U=9$, $p\leq0.05$). They also 'asked their mothers to do' something more often than ND children ($U=9$, $p\leq0.05$). Verbal autistic children 'took an object' from their mothers more frequently than DD ($U=9$, $p\leq0.05$) and ND children ($U=5.5$, $p\leq0.05$).

Initiative in Messages

There were no differences found in the use of Initiative in Messages from mothers and their children (Table 6.10). There was a group effect found in the frequency with which mothers (x^2=7.62, p≤0.05) and children (x^2=8.26, p≤0.05) 'asked for help or information'. Mothers of AV (U=7.5, p≤0.05) and DD children (U=6, p≤0.05) 'asked their children to give help or information' less than mothers of ND children. However, AV children 'asked their mothers to give help or information' less than DD (U=4.5, p≤0.01) and ND children (U=8.5, p≤0.05).

Reaction to Messages

No differences were found in the frequency of mothers' Reaction to Messages. However, verbal autistic children reacted less than non-delayed children to their mothers' initiatives (U=9, p≤0.05) (Table 6.11). AV children 'assisted' their mothers less than ND children (U=7.5, p≤0.05). There was a group effect in giving a 'positive reply' (x^2=8.02, p≤0.05); AV children 'replied' less than DD (U=5.5, p≤0.01) and ND children (U=6, p≤0.05).

Interpersonal Cues

There were no group differences in the overall frequency with which mothers and children used Interpersonal Cues (Table 6.12), except that delayed children used more Interpersonal Cues than non-delayed children (U=7, p≤0.05). Mothers of AV children 'laughed' more than mothers of DD (U=7, p≤0.05). There was a group effect in the category of 'laugh' (x^2=10.11, p≤0.01); AV children did not 'laugh or smile' at all in comparison with the DD (U=3, p≤0.01) and the ND children (U=3, p≤0.01). There was a significant difference found in the category of 'sub-verbal' between AV and ND children (U=6, p≤0.05) and 'other non-verbal' between AV and DD children (U=3.5, p≤0.05). Verbal autistic children used more 'sub-verbal' and less 'other non-verbal'.

Eye Contact

Mothers of verbal autistic children 'looked away' more than mothers of non-delayed children (U=10, $p \leq 0.05$). AV children 'established eye contact' with their mothers less than DD children (U=7.5, $p \leq 0.05$), but 'looked away' less than DD (U=9, $p \leq 0.05$) and ND children (U=9.5, $p \leq 0.05$) (Table 6.13).

Off -task Behaviours

None of the mothers showed 'off-task behaviour', which was shown only by the verbal autistic children (median=5.5, range=1-12).

Table 6.8: Frequencies of Cooperative Messages shown by Mothers and Children

Cooperative Messages	MOTHER AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	CHILD AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
give														
median	0	1	1	.15	.10	.10	1	1	0	0	.88	.69	.90	.64
range	0-2	1-4	1-4					0-2	0-2	0-7				
offer														
median	3.5	5.5	4	.80	.59	.56	1	0.5	5.5	1	.18	.08	.76	.15
range	2-23	2-8	0-13					0-7	1-10	0-5				
accept														
median	0	1	4	.14	.59	**.05***	.24	1	2.5	2	.21	.10	.18	.64
range	0-4	0-6	0-6					1-14	2-4	1-7				
request object														
median	3	0	1.5	**.02***	**.01****	.28	**.03***	0	1	1	.09	**.05***	.07	.66
range	1-4	0-0	0-3					0-1	1-9	1-4				
demonstrate														
median	1.5	1	2	.64	.43	1	.34	0	4	0	.06	.11	.23	**.03***
range	1-7	1-1	1-3					0-2	4-4	0-0				
display														
median	23	6	7	.22	.52	**.04***	.65	0.5	1	0	.36	.49	.29	.20
range	3-32	3-76	2-16					0-1	0-4	0-6				
cooperative														
median	30	13	23	.47	.37	.22	1	3	11	10	.25	.14	.20	.56
range	9-39	9-90	7-33					1-20	3-19	2-14				

Table 6.9: Frequencies of Directive Messages shown by Mothers and Children

	MOTHER							CHILD						
Directive Messages	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
point out														
median	17	11	19	.12	.07	.84	.08	0	7	8	**.003****	**.006****	**.001*****	.79
range	11-28	2-17	10-48					0-2	0-27	3-20				
attract marker														
median	7	4	3	.35	.25	.20	.80	0	3	0	**.001*****	**.009****	.14	**.03***
range	1-15	0-9	1-8					0-0	0-5	0-2				
ask to do														
median	23	12	19	.06	**.01****	.16	.45	0	2	0	**.05***	.11	.30	**.03***
range	8-31	6-17	3-29					0-3	0-7	0-2				
take														
median	2	3	2	.83	.56	.88	.66	5	1	2	**.05***	**.04***	**.03***	.56
range	0-5	1-6	0-6					3-12	0-9	1-7				
physically hold														
median	4.5	5	2	.41	.48	.50	.18	0.5	0	0	.68	.68	.41	.56
range	0-19	4-21	2-2					0-1	0-1	0-0				
prohibit														
median	2	1	2	.63	.39	.64	.54	0	0	0	.42	.44	.44	.24
range	1-4	0-7	1-2					0-1	0-2	0-0				
directive														
median	48	27	37	.10	**.05***	.31	.18	6	16	10	.21	.11	.22	.44
range	30-74	10-55	25-63					4-12	1-32	5-29				

Table 6.10: Frequencies of Initiative in Messages shown by Mothers and Children

	MOTHER							CHILD						
Initiative in Messages	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
ask help/info														
median	19	15	26	**.02***	.30	**.03***	**.02***	0	4	4	**.02***	**.006****	**.02***	.51
range	14-30	9-22	20-49					0-1	0-18	0-10				
inform														
median	24	26	28	.75	.95	.61	.44	18	17	18	.73	.37	.89	.70
range	13-46	14-36	12-43					8-37	13-41	5-52				
converse														
median	15	12	11	.66	.34	.70	.75	2	5	1	.59	.44	.90	.33
range	7-22	6-27	2-21					0-12	0-7	0-9				
initiative														
median	57	53	72	.16	.20	.28	.10	19	24	23	.53	.22	.56	.75
range	36-87	34-82	35-101					8-41	14-58	9-65				

Table 6.11: Frequencies of Reaction to Messages shown by Mothers and Children

	MOTHER							CHILD						
Reaction to Messages	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
assist														
median	5	5.5	4	.41	1	.32	.22	0	0	1	.16	.18	**.05***	.53
range	2-43	3-9	0-5					0-0	0-2	0-2				
positive reply														
median	3	7	6	.25	.18	.14	.85	5	15	16	**.02***	**.01****	**.02***	.52
range	0-9	0-13	0-13					2-7	4-20	3-34				
negative reply														
median	0	1	2	.22	.67	.16	.14	2.5	2	1	.30	.50	.16	.30
range	0-3	0-2	0-7					0-3	1-5	0-3				
comply														
median	0	0	0	.33	.86	.17	.14	5	5	5.5	.66	.42	.77	.47
range	0-8	0-7	0-0					1-14	3-14	1-11				
expand														
median	6	5	3.5	.62	.95	.56	.28	1	1	0	.90	.77	.64	.84
range	1-16	2-20	2-10					0-4	0-1	0-3				
imitate														
median	6	8	5	.76	.44	.90	.65	2	3	6	.27	.80	.27	.09
range	2-9	0-19	2-10					1-11	0-5	1-28				
feedback														
median	4	6	4	.62	.28	.66	.78	0	0	0	.22	.08	.11	.92
range	2-5	3-11	2-17					0-0	0-2	0-4				
reaction to														
median	26	35	28	.80	.56	.95	.56	14	25	29	.08	.11	**.05***	.34
range	14-67	7-45	11-46					8-35	16-36	13-54				

Table 6.12: Frequencies of Interpersonal Cues shown by Mothers and Children

Interpersonal Cues	MOTHER AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	CHILD AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
eye checking														
median	3	2	2	.19	.21	.08	1	1	1.5	0.5	.76	.70	.59	.54
range	2-10	0-7	1-3					0-3	0-4	0-1				
short eye contact														
median	2	1	1	.31	.13	.32	.88	0	1	0	.58	.32	.88	.50
range	1-6	0-3	0-7					0-1	0-1	0-7				
laugh or smile														
median	7	2	2	.09	**.04***	.08	.80	0	3	2	**.006****	**.005****	**.005****	.30
range	1-13	0-6	0-7					0-0	0-6	0-5				
sub-verbal														
median	1.5	2	1	.39	.37	.76	.18	13.5	5	2	.09	.19	**.03***	.35
range	0-3	0-4	0-2					3-23	1-18	1-5				
other non-verbal														
median	3	0	1.5	.21	.07	.46	.44	0	2	1	.13	**.05***	.79	.16
range	1-5	0-3	0-10					0-5	2-7	0-4				
interpersonal														
median	12	5	6	.45	.24	.37	.65	9	15	6	.11	.56	.28	**.02***
range	4-31	2-16	3-16					3-26	4-25	1-15				

Table 6.13: Frequencies of Eye Contact shown by Mothers and Children

	MOTHER							CHILD						
Interpersonal Cues	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
eye contact **I +**														
median	27	9	27	.42	.20	1	.34	9	14	5	.07	**.03***	.70	.07
range	7-51	3-77	1-54					1-19	5-47	0-34				
eye contact **I ***														
median	2	1	0	.13	.27	**.05***	.32	2	3	9	.07	1	**.05***	**.05***
range	0-6	0-5	0-4					0-10	0-12	5-27				
eye contact **R +**														
median	4	8	4	.26	.07	.48	.60	8	11	15	.33	.37	.16	.51
range	0-12	4-13	2-14					5-17	7-21	10-20				
eye contact **R ***														
median	0	0	0	.33	.14	.32	.53	0	0	0	1	1	1	1
range	0-0	0-1	0-1					0-0	0-0	0-0				

Key to Codes in 'Eye Contact'

eye contact **I +**	either mother or child initiates eye contact
eye contact **I ***	either mother or child looks elsewhere than the other person
eye contact **R +**	either mother or child responds to the other's initiation in eye contact
eye contact **R ***	either mother or child responds to the other's initiation of looking elsewhere

2.5. Initiatives

Certainty of Initiatives

In the developmentally-delayed group, mothers showed more 'unclear' initiatives than in the non-delayed group (U=5, $p \leq 0.05$) and more 'tight' responses than in the autistic group (U=7, $p \leq 0.05$). In all, a significant group effect was found for 'loose' responses ($x^2=6.90$, $p \leq 0.05$). Mothers of autistic (U=8.5, $p \leq 0.05$) and non-delayed (U=5, $p \leq 0.05$) children used more 'loose' responses to react to their children's initiatives than did mothers of the developmentally-delayed children (Table 6.14).

In 'exploratory' play, no differences were found for the clarity of the mothers' and the children's initiations. There was a significant group effect for 'tight' responses shown by mothers ($x^2=8.89$, $p \leq 0.01$). Mothers of autistic children responded less often with 'tight' responses to their children's initiatives compared with the delayed (U=8, $p \leq 0.05$) and the non-delayed group (U=1, $p \leq 0.01$). On the other hand, mothers of delayed children used more 'loose' responses than mothers of non-delayed children (U=6, $p \leq 0.05$). There was a group effect found in the responses of the children ($x^2=8.05$, $p \leq 0.05$). Non-delayed children showed more 'loose' reactions compared to the autistic (U=3, $p \leq 0.01$) and to the delayed (U=7, $p \leq 0.05$) children (Table 6.15).

Almost no significant differences appeared for mothers and children in 'combinatorial' (Table 6.16), in 'instrumental' (Table 6.17) and in 'symbolic' play (Table 6.18). However, in 'combinatorial' play mothers of autistic children reacted with 'loose' responses less often than mothers of non-delayed children (U=0.0, $p \leq 0.05$) (Table 6.16).

In 'ambiguous' play (Table 6.19), mothers of delayed children used utterances which were 'unclear' more often than mothers of non-delayed children (U=1, $p \leq 0.05$) and delayed children showed more 'unclear' initiatives in comparison with the autistic children (U=5, $p \leq 0.05$). Mothers of DD children showed less 'loose' responses than mothers of non-delayed children (U=0.0, $p \leq 0.05$).

In 'minimal' play (Table 6.20), mainly significant differences were found for the quality of the responses. Regarding the clarity of the initiatives autistic children had more 'unintelligible' utterances than the other two groups, but only significantly more than the non-delayed children ($U=1$, $p\leq0.05$). There was a significant group effect found for 'tight' responses shown by mothers ($x^2=6.18$, $p\leq0.05$) and children ($x^2=5.92$, $p\leq0.05$). Mothers ($U=4$, $p\leq0.01$) and children ($U=3$, $p\leq0.05$) of the delayed group responded more than the non-delayed group with 'tight' responses.

Directiveness of 'ask to do'

The communicative category 'ask to do' could be used in an 'indirect'-suggestion ($U=8$, $p\leq0.05$) or 'direct'-imperative form ($U=8$, $p\leq0.05$). Mothers of autistic children used more 'indirect' and 'direct' requests, but this finding was significant only in comparison with the mothers of the delayed children. For the children, the occurrences of directives was low. Delayed children used more direct requests than non-delayed children ($U=8.5$, $p\leq0.05$) (Table 6.21).

Table 6.14: Frequencies of Certainty for Initiatives shown in Total Play by Mothers and Children

	MOTHER							CHILD						
Certainty of Behaviours	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
unclear														
median	24	34	20	.10	.24	.65	**.02***	5	41	25	.14	.06	.14	.80
range	0-82	0-174	0-29					0-36	0-111	0-149				
unintelligible														
median	0	0	0	.57	.32	.28	1	45	0	0	.22	.16	.13	.83
range	0-0	0-18	0-12					0-135	0-122	0-43				
tight														
median	21	34	25	.14	**.02***	.56	.40	22	31	33	.16	.11	.11	.56
range	15-26	6-58	13-41					12-33	17-44	18-55				
loose														
median	186	153	230	**.03***	**.04***	.39	**.02***	79	143	143	.29	.22	.14	.10
range	153-276	0-254	156-271					31-61	27-181	0-194				

Table 6.15: Frequencies of Certainty for Initiatives shown in Exploratory Play

Certainty of Behaviours	MOTHER							CHILD						
	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
unclear														
median	12	15	5	.54	.56	.55	.30	0	14	16	.23	.19	.10	1
range	0-68	0-83	0-37					0-9	0-44	0-30				
unintelligible														
median	0	0	0	.61	.35	.32	1	6	0-0	0	.47	.45	.21	.74
range	0-0	0-29	0-10					0-71	0-56	0-19				
tight														
median	2	6	8	**.01****	**.05***	**.003****	.22	6	8	11	.31	.37	.18	.34
range	1-3	1-12	3-18					1-13	1-14	1-25				
loose														
median	143	87	145	.07	.09	.75	**.03***	56	76	103	**.02***	.22	**.01****	**.04***
range	68-194	0-174	92-217					18-82	21-119	61-146				

Table 6.16: Frequencies of Certainty for Initiatives shown in Combinatorial Play

Certainty of Behaviours	MOTHER AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	CHILD AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
unclear														
median	23	3	0	.27	.27	.12	.56	0	0	0	.47	.39	.39	1
range	0-25	0-12	0-14					0-3	0-0	0-0				
unintelligible														
median	0	0	0	1	1	1	1	0	0	0	.56	.66	.39	.32
range	0-0	0-0	0-0					0-5	0-19	0-0				
tight														
median	2	2	2	.79	.56	1	.55	-	3	2	.48	-	-	.48
range	2-2	1-2	1-4					-	3-3	1-3				
loose														
median	0	21	21	.07	.07	**.02***	.90	6	5	11	.57	.86	.29	.51
range	0-13	9-60	14-32					0-12	0-25	6-17				

Table 6.17: Frequencies of Certainty for Initiatives shown in Instrumental Play

Certainty of Behaviours	MOTHER AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	CHILD AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
unclear														
median	0	6	0	.22	.19	.48	.19	0	37	0	.18	.10	.63	.16
range	0-10	0-53	0-0					0-14	0-102	0-66				
unintelligible														
median	0	0	0	1	1	1	1	22	0	0	.35	.35	.17	.64
range	0-0	0-0	0-0					0-87	0-36	0-25				
tight														
median	5	8	7	.20	.11	.84	.13	8	11	7	.78	.44	.85	.75
range	2-9	4-18	2-12					4-17	5-17	3-23				
loose														
median	52	45	96	.38	.52	.30	.21	17	32	37	.87	.94	.81	.52
range	31-103	27-95	43-104					11-95	0-57	0-88				

Table 6.18: Frequencies of Certainty for Initiatives shown in Symbolic Play

	MOTHER							CHILD						
Certainty of Behaviours	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
unclear														
median	0	0	0	.24	.39	.48	1	0	15	0	.11	.18	1	.08
range	0-7	0-0	0-0					0-0	9-28	0-0				
unintelligible														
median	0	0	0	1	1	1	1	38	0	0	.08	.08	.16	1
range	0-0	0-0	0-0					38-38	0-0	0-0				
tight														
median	11	13	7	.26	.19	.56	.15	5	9	6	.30	.08	.60	.52
range	4-15	8-37	1-18					2-10	5-25	2-21				
loose														
median	56	38	53	.30	.16	1	.25	0	18	11	.46	.35	.22	.56
range	41-71	37-55	43-64					0-0	0-28	8-14				

Table 6.19: Frequencies of Certainty for Initiatives shown in Ambiguous Play

Certainty of Behaviours	MOTHER AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	CHILD AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
unclear														
median	5	11	0	.08	.14	.18	**.05***	0	8	2	.06	**.03***	.21	.13
range	0-10	3-12	0-4					0-6	0-26	0-10				
unintelligible														
median	0	0	0	1	1	1	1	8	0	0	.21	.18	.11	1
range	0-0	0-0	0-0					0-9	0-10	0-14				
tight														
median	1	2	1	.64	.34	.91	.54	1	2	2	.74	.46	.58	1
range	1-3	1-3	1-3					1-4	1-5	1-8				
loose														
median	7	0	11	.07	.13	.44	**.02***	0	1	0	.81	.53	.87	.64
range	0-16	0-4	4-21					0-4	0-4	0-5				

Table 6.20: Frequencies of Certainty for Initiatives shown in Minimal Play by Mothers and Children

	MOTHER							CHILD						
Certainty of Behaviours	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
unclear														
median	0	0	2	.84	.64	.56	1	2	7	4	.32	.18	.38	.39
range	0-6	0-23	0-5					0-4	0-49	0-6				
unintelligible														
median	0	0	0	.25	1	.26	.22	13	0	0	.06	.08	**.04***	.47
range	0-0	0-0	0-5					4-33	0-17	0-6				
tight														
median	2	4	2	**.05***	.13	.39	**.01****	1	4	1	**.05***	.08	.82	**.02***
range	1-6	3-14	1-4					1-5	2-5	1-3				
loose														
median	19	18	15	.63	.47	.39	.75	3	7	6	.22	.08	.24	.81
range	13-37	12-23	7-32					0-4	1-10	0-20				

Table 6.21: Frequencies of Directiveness for Initiations shown by Mothers and Children

	MOTHER							CHILD						
Directiveness 'ask to do'	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND	AV	DD	ND	K-W	M-W AV/DD	M-W AV/ND	M-W DD/ND
				p values							p values			
indirect														
median	10	3	5	.06	**.03***	.06	.48	0	0	0	.32	.53	.32	.14
range	5-15	1-11	3-16					0-1	0-1	0-0				
direct														
median	15	6	11	.11	**.03***	.57	.22	0	2	0	.08	.09	.63	**.05***
range	1-17	1-12	3-23					0-3	0-6	0-2				

2.6. Summary Tables for the Results in Study A

The results reported for Study A are summarised in Tables 6.22-6.27. The Tables on 'Communication' (Table 6.22) and 'Interpersonal Engagement' (Tables 6.23 and 6.24) appear to have the most important findings.

Table 6.22 lists the categories which yielded the most significant results for 'Play' and 'Communication'. The categories 'exploratory' play, 'point out', 'take', 'ask info', 'positive reply', 'laugh or smile' and 'off-task' discriminated the autistic children from the developmentally-delayed and the non-delayed children.

Tables 6.23 and 6.24 list the most significant results for 'Interpersonal Engagement'. The levels 'mother initiates' for the mother, 'communication' and 'no communication' for the children were distinct for the autistic group.

Table 6.25 summarises results for 'Joint Attention', showing some significant differences in 'exploratory' and in 'minimal' play.

Tables 6.26 and 6.27 reports the most significant results for 'Certainty of Initiatives'. It seems that in 'total' play and in 'exploratory' play there is a different pattern of responses mainly in the autistic group. When mothers of autistic children 'asked their children to do' something they used both 'direct' and 'indirect' requests more than mothers of the delayed group, but not in comparison to the non-delayed group.

Table 6.22: Summary Table of Significant Results for Play and Communication

	MOTHER			CHILD		
	AV/DD	AV/ND	DD/ND	AV/DD	AV/ND	DD/ND
Exploratory Play					less	
Exploratory Play Initiates				less	less	
Exploratory Play Responds	less	less			less	
Combinatorial Play						
Instrumental Play						
Symbolic Play						
Ambiguous Play Initiates						more
Minimal Play						more
Minimal Play Initiates						more
Minimal Play Responds			more	less		
Cooperative messages						
give						
offer						
accept		less				
request object	more		less	less		
demonstrate						more
display		more				
Directive messages	more					
point out				less	less	
attract marker				less		more
ask to do	more					more
take				more	more	
physically hold						
prohibit						
Initiative in messages						
ask help/info		less	less	less	less	
inform						
converse						
Reaction to messages					less	
assist					less	
positive reply				less	less	
negative reply						
comply						
expand						
imitate						
positive feedback						
Interpersonal cues						more
eye checking						
short eye contact						
laugh or smile	more			less	less	
sub-verbal					more	
other non-verbal				less		
off-task behaviours				more	more	
eye contact I +				less		
eye contact I *		more			less	less
eye contact R +						
eye contact R *						

Table 6.23: Summary Table of Significant Results for Dyadic Interpersonal Engagement

MOTHER and CHILD			
	AV/DD	AV/ND	DD/ND
TOTAL PLAY			
no communication		more	
communication		less	
mother initiates	more	more	
child initiates			
EXPLORATORY PLAY			
no communication		more	
communication		less	
mother initiates	more	more	
child initiates			
COMBINATORIAL PLAY			
no communication			
communication			
mother initiates			
child initiates			
INSTRUMENTAL PLAY			
no communication			
communication			
mother initiates	more	more	
child initiates			
SYMBOLIC PLAY			
no communication			
communication			
mother initiates	more	more	
child initiates			
AMBIGUOUS PLAY			
no communication			
communication			
mother initiates		more	
child initiates			
MINIMAL PLAY			
no communication	more	more	
communication			
mother initiates	more	more	
child initiates			

Table 6.24: Summary Table of Significant Results for Individual Interpersonal Engagement

	MOTHER			CHILD		
	AV/DD	AV/ND	DD/ND	AV/DD	AV/ND	DD/ND
TOTAL PLAY						
no communication					more	
communication				less	less	
EXPLORATORY PLAY						
no communication	more	more				
communication				less	less	
COMBINATORIAL PLAY						
no communication						
communication						
INSTRUMENTAL PLAY						
no communication						
communication						
SYMBOLIC PLAY						
no communication						
communication						
AMBIGOUS PLAY						
no communication						
communication						
MINIMAL PLAY						
no communication	more				more	
communication						

Table 6.25: Summary Table of Significant Results for Joint Attention

	MOTHER			CHILD		
	AV/DD	AV/ND	DD/ND	AV/DD	AV/ND	DD/ND
TOTAL PLAY						
looks at other						
other+object						
watches other						
object						
environment						
no theme						
EXPLORATORY PLAY						
looks at other						
other+object						
watches other					less	
object					less	
environment						
no theme						
COMBINATORIAL PLAY						
looks at other						
other+object						
watches other						
object						
environment						
no theme						
INSTRUMENTAL PLAY						
looks at other						
other+object						
watches other						
object						
environment						
no theme						
SYMBOLIC PLAY						
looks at other						
other+object						
watches other						
object						
environment						
no theme						
AMBIGOUS PLAY						
looks at other						
other+object						
watches other						
object						
environment						
no theme						
MINIMAL PLAY						
looks at other						
other+object						
watches other	more	more				
object						
environment						
no theme						

Table 6.26: Summary Table of Significant Results for Certainty of Initiatives

	MOTHER			CHILD		
	AV/DD	AV/ND	DD/ND	AV/DD	AV/ND	DD/ND
TOTAL PLAY						
unclear			more			
unintelligible						
tight	less					
loose	more		less			
EXPLORATORY PLAY						
unclear						
unintelligible						
tight	less	less				
loose			less		less	less
COMBINATORIAL PLAY						
unclear						
unintelligible						
tight						
loose		less				
INSTRUMENTAL PLAY						
unclear						
unintelligible						
tight						
loose						
SYMBOLIC PLAY						
unclear						
unintelligible						
tight						
loose						
AMBIGOUS PLAY						
unclear			more	less		
unintelligible						
tight						
loose			less			
MINIMAL PLAY						
unclear						
unintelligible					more	
tight			more			more
loose						

Table 6.27: Summary Table of Significant Results for Directiveness of 'ask to do'

	MOTHER			CHILD		
	AV/DD	AV/ND	DD/ND	AV/DD	AV/ND	DD/ND
indirect	more					
direct	more					more

2.7. Results from Further Analysis on Interpersonal Engagement

The statistical analysis for 'Interpersonal Engagement' was carried out in the Section 2.2 on collapsed levels. The Levels +3A, -3A, +4A and -4A became 'mother initiates' to define mothers' initiations when there was no communication with her child. It has already been mentioned that mothers of the verbal autistic children exhibited this category of behaviour significantly more than the mothers of the delayed and the non-delayed children.

It was decided to examine in more detail the category 'mother initiates'. Thus the Levels +3A and +4A were combined in 'mother initiates appropriately' to define mothers' tuned initiations, and -3A and -4A became 'mother initiates inappropriately' to define mothers' intrusive initiations. The Levels +4A and -4A were combined in 'response' to define mothers' successful initiations in gaining a response from their children, and the Levels +3A and -3A were combined in 'no response' to define mothers' unsuccessful initiations when they were attempting to gain a response from their children. These Levels were also examined separately for 'total' play. The Level +4A which indicates mothers' 'appropriate' initiations in gaining the child's response was labeled '+ response'; the Level -4A which indicates mothers' 'inappropriate' initiations in gaining the child's response was labeled '- response'; the Level +3A which indicates mothers' 'appropriate' initiations failing to gain the child's response was labeled '+ no response'; the Level -3A which indicates mothers' 'inappropriate' initiations failing to gain the child's response was labeled '- no response'.

Table 6.28 shows that the pattern of differences between groups is similar for both 'appropriate' and 'inappropriate' initiations.

Mothers of AV children had overall more 'appropriate' initiations ($F_{(2,18)}=13.61$, $p\leq0.001$), and in particular, in 'exploratory' ($F_{(2,18)}=4.38$, $p\leq0.05$), in 'instrumental' ($F_{(2,18)}=11.25$, $p\leq0.001$) and in 'symbolic' ($F_{(2,18)}=6.39$, $p\leq0.01$) play. Inter-group comparisons showed that mothers of verbal autistic children were more frequently initiating 'appropriately' in comparison with mothers of delayed and non-delayed children. Mothers of AV children had overall more 'inappropriate'

initiations ($F_{(2,18)}=8.51$, $p\leq0.01$), and in particular, in 'exploratory' ($F_{(2,18)}=5.58$, $p\leq0.01$), in 'instrumental' ($F_{(2,18)}=3.45$, $p\leq0.05$) and in 'symbolic' ($F_{(2,18)}=3.97$, $p\leq0.05$) play. Inter-group comparisons showed that overall, as well as in 'exploratory' and in 'symbolic' play, mothers of verbal autistic children were more frequently initiating 'inappropriately', in comparison with mothers of delayed and non-delayed children. It was only in 'instrumental' play that they initiated significantly more than mothers of non-delayed children, but not significantly more than mothers of DD children.

Table 6.29 shows that the category 'mother initiates' includes significant differences mainly in the category 'no response'.

Overall, mothers of verbal autistic children more frequently failed to gain responses from their children ($F_{(2,18)}=21.83$, $p\leq0.001$). They also failed to gain their children's responses in 'exploratory' ($F_{(2,18)}=12.51$, $p\leq0.001$), in 'instrumental' ($F_{(2,18)}=9.48$, $p\leq0.01$) and in 'symbolic' ($F_{(2,18)}=6.77$, $p\leq0.01$) play. *Post hoc* comparisons showed that the category 'no response' appeared more frequently in the verbal autistic group in comparison with the delayed and the non-delayed group. However, in 'combinatorial' play a significant group effect was found in the category 'response' ($F_{(2,18)}=6.14$, $p\leq0.05$). Mothers of delayed children gained their children's responses significantly more than mothers of autistic children.

Table 6.28: Mean Frequencies of Mothers' 'Appropriate' or 'Inappropriate' Initiatives

	MOTHER					
LEVELS DURING PLAY	AV	DD	ND	F (df=2,18)	Newman-Keuls comparisons significant at 0.05 level AV/DD	AV/ND	DD/ND
total play						
appropriate	12	2	1.86	**13.61*** **	*	*	
inappropriate	34.29	10.71	12.29	**8.51** **	*	*	
exploratory play						
appropriate	6.29	0.71	1	**4.38***	*	*	
inappropriate	17.71	6.14	7.43	**5.58** **	*	*	
combinatorial play						
appropriate	0	0	0	-			
inappropriate	1.83	3	1.33	1.81			
instrumental play						
appropriate	4.14	0.60	0.43	**11.25*** **	*	*	
inappropriate	10	2.80	3.29	**3.45***		*	
symbolic play						
appropriate	4.71	0.86	1.14	**6.39** **	*	*	
inappropriate	8.71	3.29	2.43	**3.97***	*	*	
ambiguous play						
appropriate	0.50	0.33	0.25	.16			
inappropriate	2.67	1	1.25	.86			
minimal play						
appropriate	0.67	0.67	0	.23			
inappropriate	4.83	2	2	.54			

Table 6.29: Mean Frequencies of Mothers' Initiatives in gaining a Response from the Child

	MOTHER						
LEVELS DURING PLAY	AV	DD	ND	F (df=2,18)	Newman-Keuls comparisons significant at 0.05 level AV/DD	AV/ND	DD/ND
total play							
response	15	10	9.14	2.91			
no response	31.29	2.71	5	**21.83*** **	*	*	
exploratory play							
response	8.86	5.29	5.14	2.41			
no response	15.14	1.57	3.29	**12.51*** **	*	*	
combinatorial play							
response	0.50	3	1.33	**6.14***	*		
no response	1.33	0	0	3.61			
instrumental play							
response	4.43	2.80	2.71	1.24			
no response	4.11	0.60	1	**9.48****	*	*	
symbolic play							
response	3.86	3.14	2	1.50			
no response	9.57	1	1.57	**6.77****	*	*	
ambiguous play							
response	0.33	1	0.50	1.03			
no response	2.83	0.33	1	2.03			
minimal play							
response	1.67	2	1	.115			
no response	3.83	0.67	1	1.44			

Table 6.30 shows in more detail the overall mean frequencies of mothers' initiatives. There was a significant group effect found for the categories '+ response' ($F_{(2,18)}=4.60$, $p\leq0.05$), '+ no response', ($F_{(2,18)}=19.74$, $p\leq0.001$) and '- no response' ($F_{(2,18)}=11.76$, $p\leq0.001$). Follow-up comparisons revealed that mothers of verbal autistic children failed to gain their children's response more frequently than mothers of delayed and non-delayed children, regardless of whether their initiation was 'appropriate' or 'inappropriate'. Mothers of AV children gained responses by an 'appropriate' initiation. Furthermore, looking at the mean frequencies of the categories which yielded significant differences, it seems that mothers of verbal autistic children tended to show more intrusive behaviours, to which their children failed to respond.

Table 6.30: Mean Frequencies of Mothers'
'Appropriate' (+) and 'Inappropriate' (-)
Successful and Unsuccessful Initiatives in gaining a Response

	MOTHER						
LEVELS DURING PLAY	AV	DD	ND	F (df=2,18)	Newman-Keuls comparisons significant at 0.05 level AV/DD	AV/ND	DD/ND
total play							
+ response	3.71	1.29	1	**4.60***	*	*	
- response	11.29	8.71	8.14	.93			
+ no response	8.29	0.71	0.86	**19.74*****	*	*	
- no response	23	2	4.14	**11.76*****	*	*	

3. Study B: Results from the Comparison of Pre-verbal Autistic and Verbal Autistic Groups

3.1. Play

Mothers of pre-verbal autistic (APV) children showed 'exploratory', 'combinatorial', 'instrumental' and 'ambiguous' play as frequently as mothers of verbal autistic (AV) children. However, they showed far less 'symbolic' play than mothers of AV children ($U=5.5$, $p\leq0.05$) (Table 6.31).

APV children showed 'exploratory', 'combinatorial' and 'ambiguous' play as frequently as AV children. However, they showed less 'instrumental' play ($U=5.5$, $p\leq0.05$) and virtually no 'symbolic' play ($U=0.0$, $p\leq0.01$). They also showed a higher frequency of the category 'minimal' play that conveys no message about play ($U=5$, $p\leq0.05$) (Table 6.31).

Mothers of APV children initiated less 'symbolic' acts ($U=7$, $p\leq0.05$) (Table 6.32) and showed almost no responses to such acts ($U=2$, $p\leq0.01$) (Table 6.33), probably because their children presented no initiatives for this kind of play. Mothers of APV children responded less in 'minimal' play than mothers of verbal children ($U=7$, $p\leq0.05$) (Table 6.33).

APV children initiated less 'instrumental' play ($U=5$, $p\leq0.05$), no 'symbolic' play ($U=0.0$, $p\leq0.001$) and more 'minimal' play ($U=7$, $p\leq0.05$) (Table 6.32). Although APV children initiated 'instrumental' play less frequently, they responded to their mothers 'instrumental' acts as frequently as AV children. They hardly responded to their mothers' 'symbolic' play ($U=0.5$, $p\leq0.01$) and they used more 'minimal' play to respond to their mothers' initiations ($U=5.5$, $p\leq0.05$) (Table 6.33) in comparison with the verbal children.

Table 6.31: Frequencies of Play Activities shown by Mothers and Children

	MOTHER			CHILD		
PLAY	AV	APV	M-W	AV	APV	M-W
			p values			p values
exploratory						
median	148	136	.32	69	98.5	.25
range	85-220	123-167		46-143	42-134	
combinatorial						
median	13	11	.62	5	4	.62
range	7-25	5-23		0-12	0-31	
instrumental						
median	51	54	.67	67	20	**.03***
range	31-103	43-84		17-102	5-29	
symbolic						
median	41	14.5	**.03***	23	0.5	**.002****
range	21-71	2-53		9-40	0-2	
ambiguous						
median	10	6.5	.19	9	3.5	.08
range	5-17	3-10		3-15	0-12	
minimal						
median	19	37	.20	12	52	**.02***
range	13-37	8-61		1-39	11-61	

Table 6.32: Frequencies of Initiations in Play shown by Mothers and Children

	MOTHER INITIATES			CHILD INITIATES		
PLAY	AV	APV	M-W	AV	APV	M-W
			p values			p values
exploratory						
median	141	131	.35	55	87	.20
range	83-204	119-154		35-117	29-109	
combinatorial						
median	13	11	.74	0	4	.57
range	7-25	5-23		0-2	0-31	
instrumental						
median	39	53	.43	48	8	**.02***
range	23-97	39-73		13-91	1-53	
symbolic						
median	31	14.5	**.04***	17	0	**.001*****
range	17-56	2-47		5-36	0-0	
ambiguous						
median	8	5.5	.12	6	2	.07
range	5-15	2-10		2-14	0-8	
minimal						
median	17	35	.12	7	36	**.05***
range	6-32	8-58		1-35	4-60	

Table 6.33: Frequencies of Responses in Play shown by Mothers and Children

	MOTHER RESPONDS			CHILD RESPONDS		
PLAY	AV	APV	M-W	AV	APV	M-W
			p values			p values
exploratory						
median	2	3.5	.27	12	8	.35
range	0-7	1-14		7-19	3-16	
combinatorial						
median	0	0	.40	0	0	.24
range	0-0	0-0		0-0	0-1	
instrumental						
median	6	3	.34	8	4.5	.51
range	2-12	0-26		4-19	0-17	
symbolic						
median	11	0	**.005****	5	0.5	**.003****
range	4-23	0-6		2-10	0-2	
ambiguous						
median	2	1	.38	1	1	.77
range	0-3	0-4		0-4	0-4	
minimal						
median	5	1.5	**.04***	1	6.5	**.03***
range	1-7	0-3		0-6	1-19	

3.2. Interpersonal Engagement

Overall, pre-verbal autistic (APV) children and their mothers were engaged in 'no communication' and in 'communication' as frequently as the verbal (AV) group. There were also no differences in the frequency of initiating without being in contact (Table 6.34). However, when mothers' and children's behaviours were examined separately, mothers of APV children engaged significantly less in 'communication' with their children than those in the AV group ($F(1,11)=6.42$, $p\leq0.05$) (Table 6.35).

In 'exploratory' play, mothers of APV children showed more behaviours in the level of interpersonal engagement 'mother initiates' ($F(1,11)=4.19$, $p\leq0.05$) (Table 6.34). In 'combinatorial' play, they were also found to engage less in 'communication' ($F(1,11)=5.80$, $p\leq0.05$) (Table 6.35).

In 'instrumental' play no significant differences appeared between mothers of the pre-verbal and the verbal group. APV children engaged less in 'no communication' ($F(1,11)=5.51$, $p\leq0.05$) and in 'communication' ($F(1,11)=4.72$, $p\leq0.05$) than the AV children (Table 6.35), and they initiated less in 'child initiates' ($F(1,11)=4.70$, $p\leq0.05$). One can argue that the significant differences in these levels of engagement may be an effect of the small amount of 'instrumental' play shown by the APV children. If this were the case, then the significant differences would have been found only in 'no communication' or in 'child initiates', since APV children initiated less 'instrumental' play than AV children (Table 6.32). In fact, APV children engaged significantly less in 'communication', while no significant differences were found in 'child responds' for 'instrumental' play (Table 6.33).

In 'symbolic' play, APV children and their mothers were less often engaged in 'communication' ($F(1,11)=19.13$, $p\leq0.001$) (Table 6.34). This appeared separately for the children ($F(1,11)=12.19$, $p\leq0.01$) and for their mothers ($F(1,11)=8.81$, $p\leq0.01$) (Table 6.35). Pre-verbal children showed less play at the level 'child initiates' compared to the verbal children ($F(1,11)=7.11$, $p\leq0.05$) (Table 6.34). The significant differences in these levels of engagement might be an effect of the minimal occurrence of 'symbolic' play between the APV children and their mothers.

However, if this were true then significant differences would have appeared also in the levels 'no communication' and 'mother initiates', which was not the case.

In 'minimal' play APV children and their mothers were more often in 'no communication' ($F(1,11)=9.13$, $p\leq0.01$) (Table 6.34). When mothers' and children's behaviours were examined separately, APV children were significantly more in 'no communication' than the AV children ($F(1,11)=9.81$, $p\leq0.01$) (Table 6.35). Overall differences were not found in the level of 'communication', but APV children engaged more at this level than the AV children ($F(1,11)=7.45$, $p\leq0.05$) (Table 6.35). In 'minimal' play pre-verbal children ($F(1,11)=9.35$, $p\leq0.01$) and their mothers ($F(1,11)=6.41$, $p\leq0.05$) initiated more outside communication (Table 6.34). The argument that the significant differences in interpersonal engagement for 'minimal' play may reflect the high frequency of this low level of play exhibited by APV children cannot explain the significant differences in the category 'mother initiates'. Mothers of pre-verbal children did not initiate more 'minimal' play than mothers of verbal children (Table 6.32).

Table 6.34: Mean Frequencies of Levels of Engagement shown by Mothers and Children

	MOTHER AND CHILD		
LEVELS DURING PLAY	AV	APV	F (df=1,11)
total play			
no communication	91.71	88	.03
communication	243.86	190	4.04
mother initiates	46.86	62.83	2.35
child initiates	12	6.67	2.58
exploratory play			
no communication	49.57	56	.14
communication	150.14	137.50	.37
mother initiates	24.29	41	**4.19***
child initiates	4.29	5	.09
combinatorial play			
no communication	8.43	14.80	2.55
communication	10.29	5.40	1.83
mother initiates	1.57	1.20	.32
child initiates	0.14	0.40	.47
instumental play			
no communication	21.57	15.17	1.54
communication	81.14	52	2.62
mother initiates	14.43	18.17	.59
child initiates	6.43	0.33	**4.70***
symbolic play			
no communication	7.14	1	2.57
communication	45.29	9.67	**19.13*****
mother initiates	13.43	8.50	.90
child initiates	2	0	**7.11***
ambiguous play			
no communication	6.43	2.67	1.3
communication	9.86	7.17	1.65
mother initiates	2.71	1.50	1.07
child initiates	0.57	0	**6.77***
minimal play			
no communication	8.43	22.67	**9.13****
communication	22.43	42.33	4.17
mother initiates	4.71	14.67	**6.41***
child initiates	0.43	2.67	**9.35****

Table 6.35: Mean Frequencies of Levels of Engagement shown separately by Mothers and Children

	MOTHER			CHILD		
LEVELS DURING PLAY	AV	APV	F (df=1,11)	AV	APV	F (df=1,11)
total play						
no communication	39.86	37	.06	51.63	50.83	.00
communication	147.57	111.50	**6.42***	95.53	78	1.12
exploratory play						
no communication	21.86	18.67	.37	27.76	37.33	.53
communication	105.86	83.67	2.05	49.49	53.83	.83
combinatorial play						
no communication	6.86	9.60	.56	1.83	8.67	4.49
communication	6.86	3	**5.80***	4	4	.00
instrumental play						
no communication	6.57	10.67	1.82	15.03	4.50	**5.51***
communication	36.86	31.50	.28	44.53	20.50	**4.72***
symbolic play						
no communication	3.14	1	.19	4	0	1.03
communication	29	9	**8.81****	16.29	1.33	**12.19****
ambiguous play						
no communication	2.14	1.17	.41	4.29	2.25	.87
communication	6	4.33	1.85	3.86	4.25	.07
minimal play						
no communication	3.14	4.67	.49	5.29	18	**9.81****
communication	14.43	17.33	.26	12.10	25	**7.45***

3.3. Joint Attention

Overall, there were no significant inter-group differences in joint attention between mothers and their children. The pre-verbal autistic group generally looked at each other, shared an object and used an object as frequently as the AV group (Tables 6.36 and 6.37).

In all, mothers of APV children 'watched' their children less than mothers of the AV group ($F_{(1,11)}=7.37$, $p\leq0.05$) (Table 6.36). There were no differences in 'exploratory', 'combinatorial', 'instrumental', 'ambiguous' and 'minimal' play. However, in 'symbolic' play mothers 'watched' their pre-verbal children less frequently than mothers of the verbal children ($F_{(1,11)}=6.27$, $p\leq0.05$) (Table 6.36).

Pre-verbal autistic children used less objects in 'instrumental' play ($F_{(1,11)}=7.52$, $p\leq0.05$). The APV children showed low frequencies in the categories 'mother+object' ($F_{(1,11)}=7.62$, $p\leq0.05$) and 'object' ($F_{(1,11)}=8.42$, $p\leq0.05$) for 'symbolic' play. However, these categories were produced with a higher frequency by the pre-verbal autistic children in 'minimal' play ($F_{(1,11)}=6.83$, $p\leq0.05$) ($F_{(1,11)}=8.11$, $p\leq0.05$) (Table 6.37).

Table 6.36: Mean Frequencies of Joint Attention Behaviours shown by Mothers

	AV	APV	F (df=1,11)
total play			
looks at child	7.71	11.17	.60
child+object	75.71	97.67	2.31
watches child	80.14	40.67	**7.37***
object	220.80	204.12	1.41
environment	6.32	1.30	2.41
no theme	6.60	5.75	.04
exploratory play			
looks at child	1.14	1.83	.47
child+object	48.43	72.67	3.50
watches child	66.14	36	4.13
object	144.63	142.38	.01
environment	5.75	0.96	2.91
no theme	1.34	0	1.98
combinatorial play			
looks at child	0	0	-
child+object	3.86	2	2.7
watches child	0.14	0.40	.475
object	15.29	13.80	.14
environment	0	0	-
no theme	0	0	-
instrumental play			
looks at child	0.29	0.83	1.04
child+object	29.29	32.33	.10
watches child	7.57	4.17	1.92
object	57.08	57.85	.00
environment	0	0	-
no theme	0.49	2.48	.72
symbolic play			
looks at child	1.57	0.33	3.62
child+object	13.57	10.17	.58
watches child	18.71	2.83	**6.27***
object	45.06	21.80	4.33
environment	0	0	-
no theme	0.51	0	.69
ambiguous play			
looks at child	0.86	0.17	1.75
child+object	3.43	3.33	.00
watches child	3.57	1.83	1.48
object	7.08	6.42	.03
environment	0	0.62	1.60
no theme	4.58	1.21	.98
minimal play			
looks at child	4.29	8.50	1.79
child+object	7.14	19.17	4.18
watches child	6.71	5.33	.80
object	19.97	32.65	1.76
environment	1.46	0	2.49
no theme	2.40	4.02	.23

Table 6.37: Mean Frequencies of Joint Attention Behaviours shown by Children

	AV	APV	F (df=1,11)
total play			
looks at mother	2.43	3.83	.56
mother+object	38.71	35.65	.19
watches mother	11.14	9.50	.11
object	145.91	120.43	3.77
environment	4.66	1.25	3.79
no theme	8.29	13.66	.68
exploratory play			
looks at mother	1	0.17	1.66
mother+object	23.43	27.50	.61
watches mother	9.71	9.17	.01
object	73.04	94.12	1.45
environment	2.26	0.41	2.10
no theme	1.27	1.13	.05
combinatorial play			
looks at mother	0	0	-
mother+object	1.57	1.60	0
watches mother	0	0	-
object	6	13.33	1.38
environment	0	0	-
no theme	0	0	-
instrumental play			
looks at mother	0	0	-
mother+object	14.86	7.33	2.56
watches mother	0.14	0.17	.01
object	65.29	25.33	**7.52***
environment	0.53	0	.85
no theme	0.18	0	.85
symbolic play			
looks at mother	0	0	-
mother+object	4.14	0.17	**7.62***
watches mother	0.57	0	3.12
object	20.78	1.33	**8.42***
environment	0.75	0	.40
no theme	0.76	0	1.49
ambiguous play			
looks at mother	0.14	0.50	.54
mother+object	1.71	0.83	1.93
watches mother	0.43	0.17	.54
object	5	3.71	.27
environment	0.56	0	2.40
no theme	3.15	2.79	.05
minimal play			
looks at mother	1.29	3.50	1.73
mother+object	3.57	12.83	**6.83***
watches mother	0.86	2.50	2.64
object	9.80	34.17	**8.11***
environment	1.73	0.29	1.55
no theme	4.30	11.21	1.51

3.4. Communication

Cooperative Messages

Overall, no great differences were found in the use of Cooperative Messages (Table 6.38). Mothers of pre-verbal autistic children 'gave an object' to their children more often than mothers of verbal children ($U=1$, $p\leq0.05$) but they 'offered an object' to them rarely ($U=0.5$, $p\leq0.05$).

No differences were found in the frequency of Cooperative Messages between pre-verbal and verbal autistic children.

Directive Messages

Mothers of pre-verbal autistic children used Directive Messages more often than mothers of AV children ($U=7$, $p\leq0.05$) (Table 6.39). They used an 'attract marker' ($U=3$, $p\leq0.01$) and they 'took an object' from their children significantly more ($U=7.5$, $p\leq0.05$) (Table 6.39).

No differences were found in the frequency of Directive Messages between APV and AV children.

Initiative in Messages

Mothers of pre-verbal autistic children 'asked for help or information', 'informed' and 'conversed with their children' as frequently as mothers of AV children (Table 6.40). However, APV children used less Initiatives in Messages than AV children ($U=0.0$, $p\leq0.01$). They hardly 'informed' ($U=0.0$, $p\leq0.01$) or 'conversed' with their mothers at all ($U=9$, $p\leq0.05$) (Table 6.40).

Reaction to Messages

Mothers of pre-verbal autistic children did not react to their children's initiatives as frequently as mothers of verbal children ($U=4$, $p\leq0.01$) (Table 6.41). Mothers of AV children 'assisted' ($U=2$, $p\leq0.01$) their children and 'imitated' ($U=1.5$, $p\leq0.001$) them less than mothers of AV children.

No differences were found in the frequency of Reaction to Messages between APV and AV children.

Interpersonal Cues

Mothers of pre-verbal autistic children used Interpersonal Cues overall as often as mothers of verbal children, but they 'laughed' less ($U=4.5$, $p\leq0.05$). APV children used Interpersonal Cues more frequently overall than AV children ($U=5.5$, $p\leq0.05$). APV children more frequently 'laughed' ($U=6$, $p\leq0.05$) and used the category 'sub-verbal' ($U=6$, $p\leq0.05$). It is assumed that the significant difference in the category 'sub-verbal' contributes to the significant difference in Interpersonal Cues produced by APV children (Table 6.42).

Eye Contact

Mothers of pre-verbal autistic children 'looked away' ($U=4$, $p\leq0.01$) and 'responded to their children's eye contact' ($U=5.5$, $p\leq0.05$) less often than mothers of AV children (Table 6.43). It might be that mothers responded less frequently because their children 'established eye contact' with them less often ($U=4$, $p\leq0.01$).

Off -task Behaviours

Like the mothers of verbal autistic children, mothers of pre-verbal children did not show any 'off-task behaviour'. APV (median=2.5, range 1-15) children showed 'off-task behaviour' as frequently as AV (median=5.5, range 1-12) children.

Table 6.38: Frequencies of Cooperative Messages shown by Mothers and Children

	MOTHER			CHILD		
Cooperative Messages	AV	APV	M-W	AV	APV	M-W
			p values			p values
give						
median	0	4	**.02***	1	0	.10
range	0-2	1-7		0-2	0-1	
offer						
median	3.5	1	**.03***	0.5	0	.57
range	2-23	0-2		0-7	0-2	
accept						
median	0	0	.29	1	3	.36
range	0-4	0-1		1-14	1-4	
request object						
median	3	0	.28	0	2	.08
range	1-4	0-5		0-1	0-3	
demonstrate						
median	1.5	2	.70	0	0	.26
range	1-7	1-9		0-2	0-0	
display						
median	23	33	.23	0.5	0	.39
range	3-32	7-102		0-1	0-2	
cooperative						
median	30	37.5	.35	3	4.5	.66
range	9-39	19-115		1-20	3-7	

Table 6.39: Frequencies of Directive Messages shown by Mothers and Children

	MOTHER			CHILD		
Directive Messages	AV	APV	M-W	AV	APV	M-W
			p values			p values
point out						
median	17	9.5	.09	0	0	.82
range	11-28	6-28		0-2	0-5	
attract marker						
median	7	17	**.01****	0	0	1
range	1-15	13-23		0-0	0-0	
ask to do						
median	23	20	.72	0	0	.08
range	8-31	12-36		0-3	0-0	
take						
median	2	5	**.05***	5	2.5	.08
range	0-5	0-18		3-12	1-7	
physically hold						
median	4.5	36.5	.13	0.5	0	.07
range	0-19	1-60		0-1	0-0	
prohibit						
median	2	1	.59	0	0	1
range	1-4	0-5		0-1	0-1	
directive						
median	48	87	**.05***	6	4	.08
range	30-47	35-99		4-12	2-7	

Table 6.40: Frequencies of Initiative in Messages shown by Mothers and Children

	MOTHER			CHILD		
Initiative in Messages	AV	APV	M-W	AV	APV	M-W
			p values			p values
ask help/info						
median	19	14.5	.47	0	0	.43
range	14-30	1-35		0-1	0-1	
inform						
median	24	26.5	.94	18	0.5	**.003****
range	13-46	9-41		8-37	0-3	
converse						
median	15	8	.17	2	0	**.04***
range	7-22	4-24		0-12	0-0	
initiative						
median	57	52.5	.39	19	1	**.002****
range	36-87	27-77		8-41	0-4	

Table 6.41: Frequencies of Reaction to Messages shown by Mothers and Children

	MOTHER			CHILD		
Reaction to Messages	AV	APV	M-W	AV	APV	M-W
			p values			p values
assist						
median	5	1	**.01****	0	0	.36
range	2-43	0-4		0-0	0-1	
positive reply						
median	3	0	.07	5	5	1
range	0-9	0-0		2-7	1-9	
negative reply						
median	0	0	.69	2.5	3.5	.58
range	0-3	0-2		0-3	0-8	
comply						
median	0	2	.07	5	13	.09
range	0-8	0-13		1-14	3-45	
expand						
median	6	2	.10	1	0	.12
range	1-16	1-2		0-4	0-0	
imitate						
median	6	1	**.001*****	2	2	.62
range	2-9	0-3		1-11	0-4	
feedback						
median	4	7	.51	0	0	1
range	2-5	1-8		0-0	0-0	
reaction						
median	26	10.5	**.01****	14	16.5	.32
range	14-67	6-20		8-35	10-47	

Table 6.42: Frequencies of Interpersonal Cues shown by Mothers and Children

	MOTHER			CHILD		
Interpersonal Cues	AV	APV	M-W	AV	APV	M-W
			p values			p values
eye checking						
median	3	3	.57	1	0	.42
range	2-10	1-5		0-3	0-2	
short eye contact						
median	2	3	.76	0	0	.24
range	1-6	1-4		0-1	0-0	
laugh or smile						
median	7	1	**.05***	0	1	**.03***
range	1-13	0-4		0-0	0-1	
sub-verbal						
median	1.5	1	.86	13.5	35.5	**.05***
range	0-3	0-6		3-23	2-63	
other non-verbal						
median	3	1	.40	0	1	.14
range	1-5	0-6		0-5	1-10	
interpersonal						
median	12	9.5	.61	9	37.5	**.03***
range	4-31	8-12		3-26	4-64	

Table 6.43: Frequencies of Eye Contact shown by Mothers and Children

	MOTHER			CHILD		
Eye contact	AV	APV	M-W	AV	APV	M-W
			p values			p values
eye contact **I +**						
median	27	20.5	.28	9	0	**.01****
range	7-51	12-35		1-19	0-6	
eye contact **I ***						
median	2	0	**.01****	2	2.5	.71
range	0-6	0-1		0-10	0-13	
eye contact **R +**						
median	4	0	**.02***	8	7.5	.35
range	0-12	0-3		5-17	4-11	
eye contact **R ***						
median	0	0	1	0	0	1
range	0-0	0-0		0-0	0-0	

Key to Codes in 'Eye Contact'

eye contact **I +**	either mother or child initiates eye contact
eye contact **I ***	either mother or child looks elsewhere than the other person
eye contact **R +**	either mother or child responds to the other's initiation in eye contact
eye contact **R ***	either mother or child responds to the other's initiation of looking elsewhere

3.5. Initiatives

Certainty of Initiatives

In Study B, no differences were found between mothers of verbal and pre-verbal autistic children in the clarity of their initiatives (Tables 6.44-6.50). Overall mothers of pre-verbal children showed less 'tight' responses than mothers of verbal children ($U=5.5$, $p\leq0.05$).

Some significant differences were found for the children. Overall, pre-verbal children did not use significantly more 'unclear' and 'unintelligible' utterances than the verbal autistic children. However, they used less often 'loose' responses to react to their mothers' initiations ($U=3$, $p\leq0.01$) (Table 6.44).

Pre-verbal children used significantly more 'unintelligible' utterances in 'exploratory' play ($U=6.5$, $p\leq0.05$) (Table 6.45) and in 'minimal' play ($U=2$, $p\leq0.05$) (Table 6.50). They showed significantly less 'tight' responses for 'symbolic' play ($U=0.5$, $p\leq0.05$) (Table 6.48), but more 'tight' responses for 'minimal' play ($U=3.5$, $p\leq0.05$) (Table 6.50) than the verbal children. Pre-verbal children also exhibited less 'loose' responses than the verbal children in 'exploratory' ($U=4$, $p\leq0.05$) (Table 6.45) and in 'instrumental' play ($U=2$, $p\leq0.001$) (Table 6.47).

Directiveness of 'ask to do'

No differences were found between mothers of verbal and pre-verbal autistic children in the directiveness of the category 'ask to do' (Table 6.51).

Table 6.44: Frequencies of Certainty for Initiatives shown in Total Play by Mothers and Children

	MOTHER			CHILD		
Certainty of Behaviours	AV	APV	M-W	AV	APV	M-W
			p values			p values
unclear						
median	24	22	.80	5	0	.09
range	0-82	0-197		0-36	0-18	
unintelligible						
median	0	0	1	45	114	.06
range	0-0	0-0		0-135	17-159	
tight						
median	21	9	**.02***	22	16	.39
range	15-26	2-21		12-33	9-45	
loose						
median	186	193	.46	79	17	**.01****
range	153-276	0-221		31-61	0-66	

Table 6.45: Frequencies of Certainty for Initiatives shown in Exploratory Play by Mothers and Children

	MOTHER			CHILD		
Certainty of Behaviours	AV	APV	M-W	AV	APV	M-W
			p values			p values
unclear						
median	12	15	.85	0	0	.49
range	0-68	0-136		0-9	0-20	
unintelligible						
median	0	0	1	6	89	**.04***
range	0-0	0-0		0-71	0-122	
tight						
median	2	2	.51	6	5	.88
range	1-3	1-6		1-13	2-14	
loose						
median	143	123	.27	56	13	**.02***
range	68-194	0-152		18-82	0-42	

Table 6.46: Frequencies of Certainty for Initiatives shown in Combinatorial Play by Mothers and Children

	MOTHER			CHILD		
Certainty of Behaviours	AV	APV	M-W	AV	APV	M-W
			p values			p values
unclear						
median	23	-	-	0	0	.48
range	0-25	-		0-3	0-0	
unintelligible						
median	-	-	-	0	17	.14
range	-	-		0-5	4-31	
tight						
median	2	-	-	-	1	-
range	2-2	-		-	1-1	
loose						
median	0	-	-	6	0	.14
range	0-13	-		0-12	0-0	

Table 6.47: Frequencies of Certainty for Initiatives shown in Instrumental Play by Mothers and Children

	MOTHER			CHILD		
Certainty of Behaviours	AV	APV	M-W	AV	APV	M-W
			p values			p values
unclear						
median	0	22	.19	0	0	.08
range	0-10	0-46		0-14	0-0	
unintelligible						
median	0	0	1	22	15	.94
range	0-0	0-0		0-87	0-59	
tight						
median	5	4	.68	8	4	.28
range	2-9	1-20		4-17	2-12	
loose						
median	52	31	.39	17	2	**.006****
range	31-103	0-84		11-95	0-13	

Table 6.48: Frequencies of Certainty for Initiatives shown in Symbolic Play by Mothers and Children

	MOTHER			CHILD		
Certainty of Behaviours	AV	APV	M-W	AV	APV	M-W
			p values			p values
unclear						
median	0	0	.62	0	0	1
range	0-7	0-0		0-0	0-0	
unintelligible						
median	0	0	1	38	0	.32
range	0-0	0-0		38-38	0-0	
tight						
median	11	4	.26	5	1	**.05***
range	4-15	4-4		2-10	1-2	
loose						
median	56	53	1	0	1	.32
range	41-71	53-53		0-0	1-1	

Table 6.49: Frequencies of Certainty for Initiatives shown in Ambiguous Play by Mothers and Children

	MOTHER			CHILD		
Certainty of Behaviours	AV	APV	M-W	AV	APV	M-W
			p values			p values
unclear						
median	5	0	.16	0	0	.22
range	0-10	0-0		0-6	0-0	
unintelligible						
median	0	0	1	8	5	.75
range	0-0	0-0		0-9	0-12	
tight						
median	1	1	.39	1	2	1
range	1-3	1-2		1-4	1-2	
loose						
median	7	8	.74	0	0	.79
range	0-16	6-10		0-4	0-3	

Table 6.50: Frequencies of Certainty for Initiatives shown in Minimal Play by Mothers and Children

	MOTHER			CHILD		
Certainty of Behaviours	AV	APV	M-W	AV	APV	M-W
			p values			p values
unclear						
median	0	14	.13	2	0	.12
range	0-6	0-57		0-4	1-3	
unintelligible						
median	0	0	1	13	50	**.03***
range	0-0	0-0		4-33	11-61	
tight						
median	2	2	.56	1	6	**.03***
range	1-6	1-3		1-5	1-17	
loose						
median	19	20	.46	3	1	.23
range	13-37	0-30		0-4	0-3	

Table 6.51: Frequencies of Directiveness for Initiations shown in Play by Mothers and Children

		MOTHER			CHILD		
Directiveness 'ask to do'		AV	APV	M-W	AV	APV	M-W
				p values			p values
indirect							
	median	10	10	.77	0	0	.35
	range	5-15	6-17		0-1	0-0	
direct							
	median	15	10	.67	0	0	.17
	range	1-17	3-23		0-3	0-0	

3.6. Summary Tables for the Results in Study B

The results reported for Study B are summarised in Tables 6.52-6.57. Tables on 'Play', 'Communication' (Table 6.52) and 'Interpersonal Engagement' (Tables 6.53 and 6.54) appear to have the most important findings.

In Table 6.52, significant differences were found in 'instrumental' play, in 'symbolic' play and in 'minimal' play. For the categories of 'Communication', significant results appeared in 'Directive Messages', in 'Initiative in Messages', in 'Reaction to Messages', in 'Interpersonal Cues' and in 'Eye Contact' as they were exhibited by pre-verbal autistic children and their mothers.

Tables 6.53 and 6.54 show that the levels 'communication' and 'no communication' yielded the most significant results.

Table 6.55 summarises the results for 'Joint Attention'; the use of an 'object' for the pre-verbal children and the observation of the pre-verbal child's activity by the mother were significantly different from the verbal group.

Table 6.56 shows that pre-verbal children exhibited more 'unintelligible' initiatives and less 'loose' responses than the verbal children.

No differences were found in the use of 'indirect' or 'direct' requests between mothers of pre-verbal and verbal children (Table 6.57).

Table 6.52: Summary Table of Significant Results for Play and Communication

	MOTHERs of APV	APV CHILDREN
Exploratory Play		
Combinatorial Play		
Instrumental Play		less
Instrumental Play Initiates		less
Instrumental Play Responds		
Symbolic Play	less	less
Symbolic Play Initiates	less	less
Symbolic Play Responds	less	less
Ambiguous Play		
Minimal Play		more
Minimal Play Initiates		more
Minimal Play Responds	less	more
Cooperative Messages		
give	more	
offer	less	
accept		
request object		
demonstrate		
display		
Directive Messages	more	
point out		
attract marker	more	
ask to do		
take	more	
physically hold		
prohibit		
Initiative in Messages		less
ask help/info		
inform		less
converse		less
Reaction to Messages	less	
assist	less	
positive reply		
negative reply		
comply		
expand		
imitate	less	
positive feedback		
Interpersonal cues		more
eye checking		
short eye contact		
laugh or smile	less	more
sub-verbal		more
other non-verbal		
off-task behaviours		
eye contact I +		less
eye contact I *	less	
eye contact R +	less	
eye contact R*		

Table 6.53: Summary Table of Significant Results for Dyadic Interpersonal Engagement

MOTHERS and CHILDREN of the APV group	TOTAL	EXPL	COMB	INSTR	SYMB	AMB	MIN
no communication							more
communication					less		

Table 6.54: Summary Table of Significant Results for Individual Interpersonal Engagement

MOTHERs of APV	TOTAL	EXPL	COMB	INSTR	SYMB	AMB	MIN
no communication							
communication	less		less		less		
mother initiates		more					more
APV CHILDREN	TOTAL	EXPL	COMB	INSTR	SYMB	AMB	MIN
no communication				less			more
communication				less	less		more
child initiates				less	less	less	more

Table 6.55: Summary Table of Significant Results for Joint Attention

MOTHERs of APV	TOTAL	EXPL	COMB	INSTR	SYMB	AMB	MIN
looks at child							
child+object							
watches child	less				less		
object							
environment							
no theme							
APV CHILDREN	TOTAL	EXPL	COMB	INSTR	SYMB	AMB	MIN
looks at mother							
mother+object					less		more
watches mother							
object				less	less		more
environment							
no theme							

Table 6.56: Summary Table of Significant Results for Certainty of Initiatives

MOTHERs of APV	TOTAL	EXPL	COMB	INSTR	SYMB	AMB	MIN
unclear							
unintelligible							
tight	less						
loose							
APV CHILDREN	TOTAL	EXPL	COMB	INSTR	SYMB	AMB	MIN
unclear							
unintelligible		more					more
tight					less		more
loose	less	less		less			

Table 6.57: Summary Table of Significant Results for Directiveness of 'ask to do'

MOTHERs of APV	ASK TO DO
indirect	-
direct	-
APV CHILDREN	ASK TO DO
indirect	-
direct	-

CHAPTER 7 DISCUSSION OF FINDINGS AND CONCLUDING REMARKS

The microanalysis of videos has given rich data on the communicative play of two groups of children during interactions with their mothers at home: verbal autistic children, who were matched with appropriate control groups, and pre-verbal autistic children. In this chapter, I will discuss the results presented in the previous chapter in an attempt to further clarify our understanding concerning the psychological nature of autism. I will also examine some methods for improving communication between mothers and their autistic children and propose some ideas to be studied in future projects suggested by the findings.

1. SUMMARY OF THE FINDINGS OF THIS THESIS

1.1. Study A: Comparison of Verbal Autistic, Developmentally-Delayed and Non-Developmentally-Delayed Groups

This study compared communicative play between verbal autistic (AV), developmentally-delayed (DD) and non-delayed (ND) children during interactions with their mothers at home. Each group was composed of 7 dyads who had been identified with a screening instrument, the Subject Selection Inventory (SSI). The autistic and the developmentally-delayed children's chronological age ranged from 4 to 6 years. The autistic children were matched with the developmentally-delayed and the non-delayed children on the Reynell Language Scales (Reynell and Huntley, 1985) and they were functioning at the language level of a normally developing child of 2 years. The most important results of the video analysis are summarized below:

- Few differences were identified in the play and communicative behaviours of the mothers. Mothers of AV children were as playful as mothers of DD and ND children, but they responded less often to their children's exploratory play than mothers of the other two groups. Their responses were also less often 'tight', (i.e. reactions to

verbal or non-verbal messages, apparently accepting their message). Nevertheless, the actual communicative behaviours of mothers with AV children were similar to those of mothers in the other two groups.

- Verbal autistic children were as playful as delayed and non-delayed children, except that during 'exploratory' play AV children initiated less often than DD and ND children, and responded less than ND children. The communicative behaviours of AV children were quite different from DD and ND children. Positive categories such as 'point out', 'ask help/info', 'positive reply' and 'laugh or smile' occurred less frequently in the AV group and, on the other hand, negative categories such as 'take' and 'off-task' appeared more often.
- The interpersonal engagement between mothers and their verbal autistic children was quite distinctive. Autistic children were significantly less in defined 'communication' during the whole play session compared to the other two groups[1] (Figures 7.1 and 7.2). Mothers and children of the AV group did not establish interpersonal contact during their 'exploratory' play as often as the other two groups. However, the most striking characteristic is the frequent occurrence of the category 'mother initiates' in the verbal autistic group. Mothers initiated when there was no interpersonal contact and throughout nearly all play categories, including 'total' play, 'exploratory', 'instrumental', 'symbolic' and 'minimal' play (Figure 7.3). When this category was analysed in more detail, it was found that in 'total', 'exploratory', 'instrumental' and 'symbolic' play these initiations could be both 'appropriate' and 'inappropriate' in relation to the autistic children's playful acts (Figure 7.4). It was also found that mothers failed to gain their children's responses in 'total' play, 'exploratory', 'instrumental' and 'symbolic' play significantly more than mothers of delayed and non-delayed children (Figure 7.5). Another interesting result was that, while mothers of verbal autistic children occasionally managed to gain a response by trying to match their child's behaviours (+ response), at other times this

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[1] Some differences in 'Interpersonal Engagement' are presented here graphically. Detailed information can be found in Chapter 6, Section 2.2 (Tables 6.4 and 6.5) and Section 2.7 (Tables 6.28, 6.29 and 6.30).

approach failed (+ no response) (Figure 7.6). Very frequently, however, mothers initiated intrusively and this may be the reason why their children did not respond (- no response).

Figure 7.1: Mean Frequencies of the Level 'Communication'

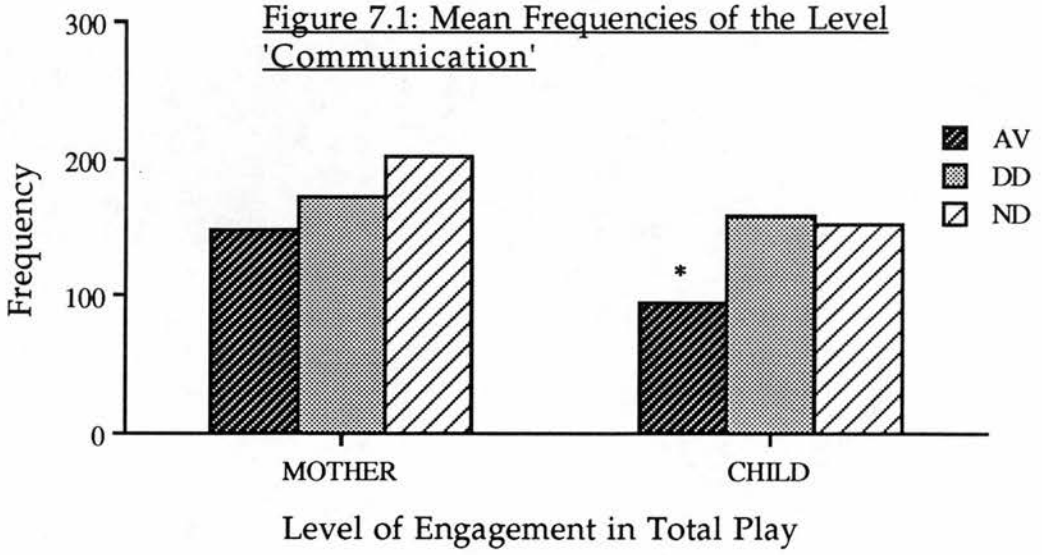
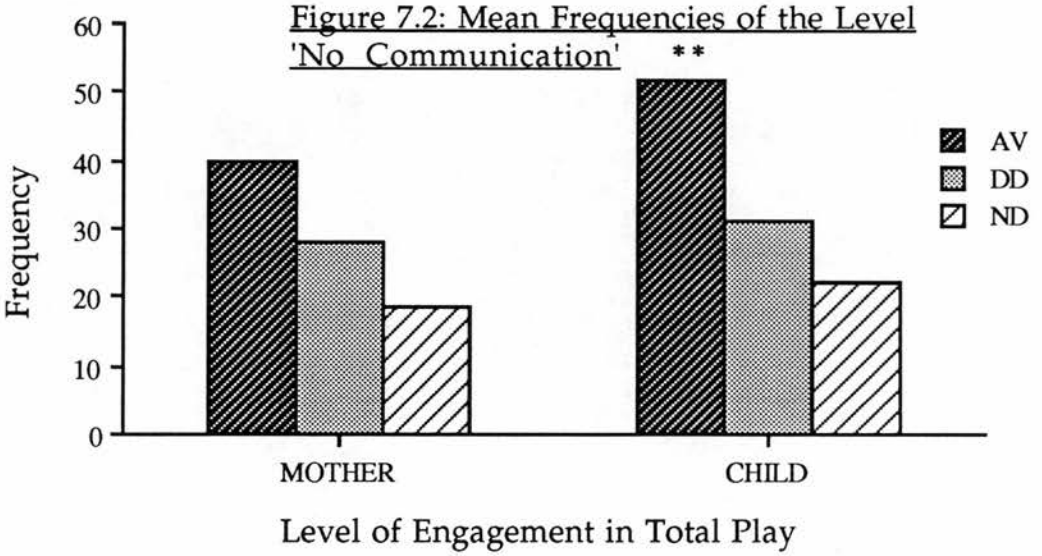


Figure 7.2: Mean Frequencies of the Level 'No Communication'



Key to Codes in Figures 7.1 and 7.2

Levels of significance apply to comparisons between AV, DD and ND groups	
significant at 0.05 level ($p \leq 0.05$)	*
significant at 0.01 level ($p \leq 0.01$)	**

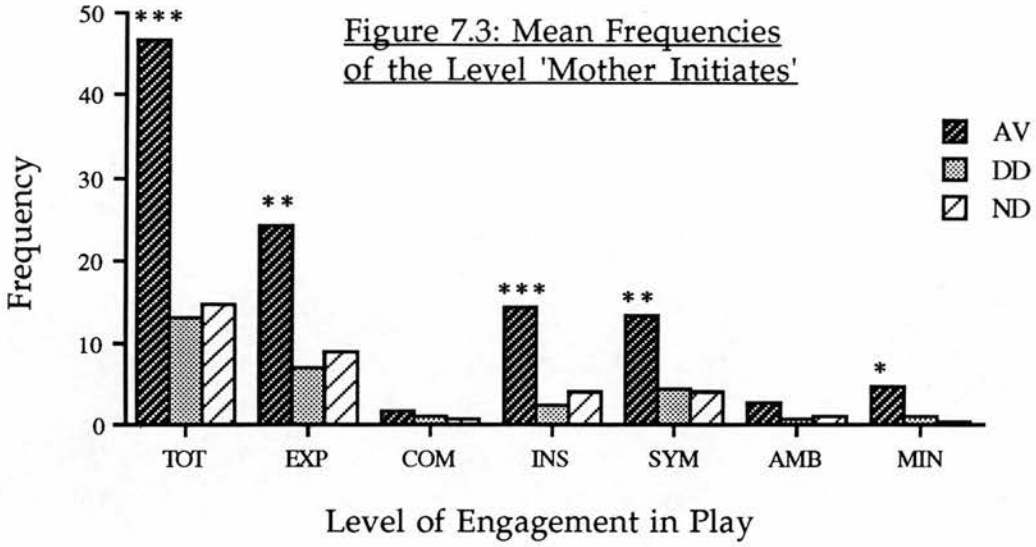


Figure 7.3: Mean Frequencies of the Level 'Mother Initiates'

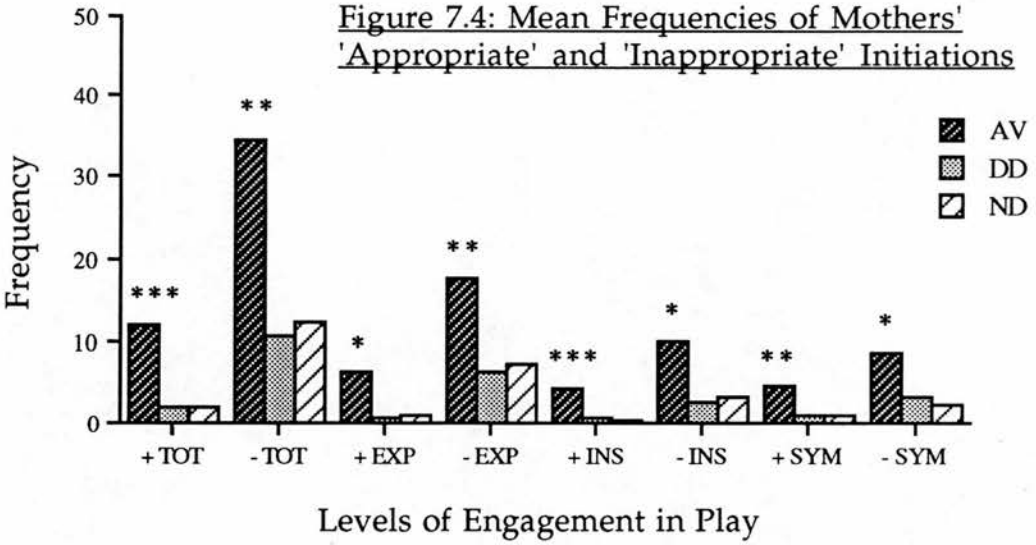


Figure 7.4: Mean Frequencies of Mothers' 'Appropriate' and 'Inappropriate' Initiations

Key to Codes in Figures 7.3 and 7.4

Total Play	**TOT**
Exploratory Play	**EXP**
Combinatorial Play	**COM**
Instrumental Play	**INS**
Symbolic Play	**SYM**
Ambiguous Play	**AMB**
Minimal Play	**MIN**
Appropriate Initiation	**+**
Inappropriate Initiation	**-**
Levels of significance apply to comparisons between AV, DD and ND groups	
significant at 0.05 level ($p \leq 0.05$)	*
significant at 0.01 level ($p \leq 0.01$)	**
significant at 0.001 level ($p \leq 0.001$)	***

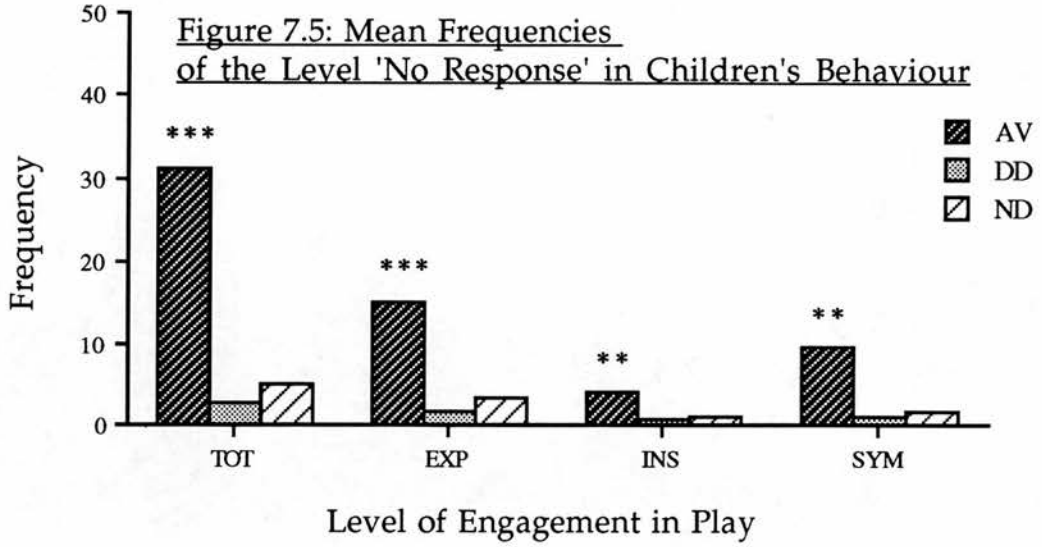


Figure 7.5: Mean Frequencies of the Level 'No Response' in Children's Behaviour

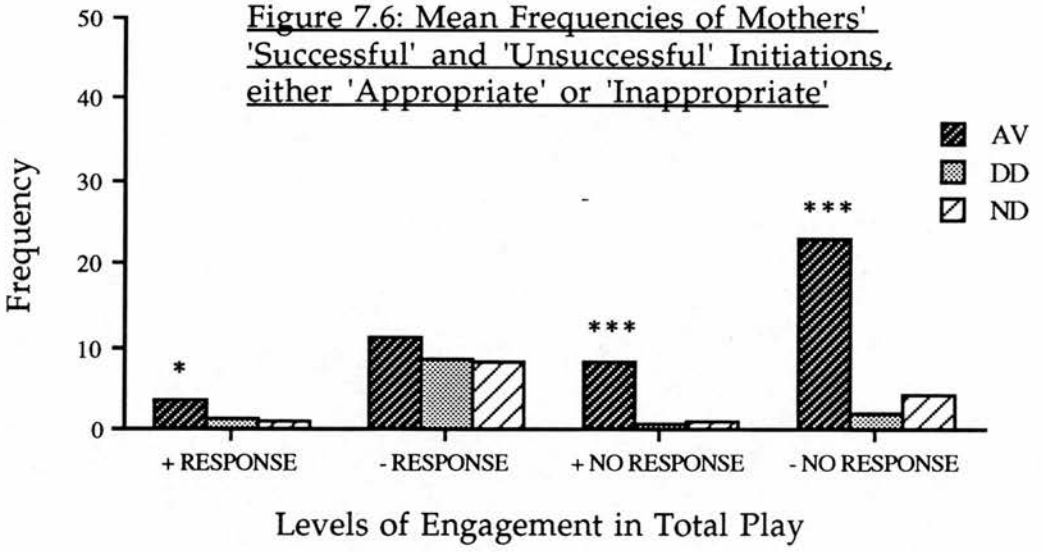


Figure 7.6: Mean Frequencies of Mothers' 'Successful' and 'Unsuccessful' Initiations, either 'Appropriate' or 'Inappropriate'

Key to Codes in Figures 7.5 and 7.6

Total Play	**TOT**
Exploratory Play	**EXP**
Instrumental Play	**INS**
Symbolic Play	**SYM**
Appropriate Initiation	**+**
Inappropriate Initiation	**-**
Mother gained the child's response	**Response**
Mother did not gain the child's response	**No Response**
Levels of significance apply to comparisons between AV, DD and ND groups	
significant at 0.05 level ($p \leq 0.05$)	*
significant at 0.01 level ($p \leq 0.01$)	**
significant at 0.001 level ($p \leq 0.001$)	***

1.2. Study B: Comparison of Verbal and Pre-verbal Autistic Groups

Communicative play of 7 verbal autistic (AV) children, who had participated in the previous study, and 6 pre-verbal autistic (APV) children was filmed while they were interacting with their mothers at home. The children in the two groups were not matched. Pre-verbal children were not testable on the Reynell Language Scales (Reynell and Huntley, 1985), their scores being below the 1 year level. However, in the domains of Vineland Adaptive Behaviour Scales (Sparrow et al, 1984) the mean developmental age of this group was approximately one year lower than the verbal group. The chronological age of the pre-verbal group ranged from 3 to 6 years while the verbal group were from 4 to 6 years of age. A summary of the most important results from the microanalysis is as follows:

- The pre-verbal autistic and the verbal autistic group appeared to be quite different in their play and communication. Mothers of the APV children showed less 'symbolic' play, for both initiations and responses, than mothers of AV children. They used more basic communicative behaviours such as 'give' instead of 'offer' and more directives such as 'attract marker' and 'take'. They reacted to their children less, particularly in 'assist' and 'imitate'. Furthermore, mothers of pre-verbal children showed less interpersonal cues such as 'laugh or smile', and they responded less often to 'eye contact'.
- In comparison with the verbal autistic children, pre-verbal children showed less 'instrumental' play initiating less often in this type of play, and they showed less initiations and responses in 'symbolic' play. They initiated generally less often, particularly in the categories 'inform' and 'converse'. They used interpersonal cues more often, mainly the categories 'laugh or smile' and 'other non-verbal'. However, they established 'eye contact' less often with their mothers.
- Important results were found in 'Interpersonal Engagement' and 'Joint Attention' behaviours, especially of the mothers. Mothers and pre-verbal children engaged as a dyad less in 'communication' during 'symbolic' play and more in 'no communication' during

'minimal' play. Overall and in 'symbolic' play, mothers engaged minimally with their pre-verbal child in 'communication' and in 'watching the child'. The category of 'mother initiates' appeared more often in 'exploratory' and in 'minimal' play, although these types of play were shown by mothers of APV children as frequently as by mothers of AV children. Pre-verbal autistic children engaged in 'communication' and 'initiated' less frequently during 'instrumental' and 'symbolic' play. Their 'minimal' play occurred very often, and therefore, they 'initiated' and were either in 'communication' or 'not in communication' more frequently than verbal autistic children.

- The mothers' responses to their pre-verbal children were less often 'tight' compared to the mothers of the verbal autistic children. On the contrary, the pre-verbal children's responses, compared to the responses of the verbal autistic children, were more often 'loose', (i.e. relatively unspecific or unimaginative reactions to behaviours of the partner or to verbal or non-verbal messages). Their initiatives were very frequently 'unintelligible', largely because they were communicating at a pre-linguistic level.

Thus may the main findings of this thesis be summarized. In the following sections, the relevance that these findings may have for increasing our understanding of interpersonal aspects in the behaviours of children with autism and for planning intervention to improve interaction between young autistic children and their mothers, will be discussed.

2. The Psychological Nature of Autism

2.1. Play

It was initially surprising that verbal autistic children showed 'instrumental' and 'symbolic' play as frequently as the developmentally-delayed and the normally developing children, while they initiated less 'exploratory' play. This finding does not accord with the belief that autistic children are impaired in their 'instrumental' and 'symbolic' play (Sigman and Ungerer, 1984a; Lewis and Boucher, 1988; Stone et al, 1990), but it is consistent with some studies carried out in differing settings

which found 'instrumental' play (Ungerer and Sigman, 1981; Doherty and Rosenfeld, 1984; Baron-Cohen, 1987; Lewis and Boucher, 1988) and 'symbolic' play (Lewis and Boucher, 1988; Stone et al, 1990) to be unimpaired in autistic children. The occurrence of a low quantity of symbolic play in comparison groups has also been observed in another study by Mundy, Sigman, Ungerer and Sherman (1986). Although in a group of 18 autistic, 18 delayed and 18 non-delayed children, 15 autistic children were distinguished at this study from the other groups on symbolic play, there were 7 delayed and 5 non-delayed children who exhibited little if any symbolic play. In contrast to Study A in which significant differences were not found between the groups for 'instrumental' and 'symbolic' play, in Study B the pre-verbal autistic group showed a very low frequency of 'instrumental' and 'symbolic' play. These findings can have many explanations.

First of all, the groups in Study A were matched on verbal mental age and advanced forms of play correlate with language development in normally developing (Piaget, 1962; Vygotsky, 1966) and in autistic children (Ungerer and Sigman, 1981; Mundy et al, 1987). This appears to explain why the verbal autistic children were not impaired in their 'instrumental' and 'symbolic' play. This relationship of play with language also explains why the pre-verbal autistic children produced less 'instrumental' and 'symbolic' play, and why their mothers, being sensitive and responsive to their children's cognitive level of functioning, exhibited less 'symbolic' play. The inability of pre-verbal children to initiate 'instrumental' play while they could respond to initiations to perform 'instrumental' acts might be an indication that they need to have a model that makes reference to the immediate context in order to perform more advanced forms of play. The mothers of the pre-verbal autistic children were involved in 'instrumental' play as much as the mothers of the verbal autistic children and, so, they facilitated the occurrence of this play category. However, there was in the former group a pervasive lack of 'symbolic' play in both initiations and responses, which shows that pre-verbal autistic children cannot achieve the transition from 'instrumental' to 'symbolic' play and this appears to be linked to their impairments in language. Being unable to participate

in complex forms of play, these children were mostly involved in what we have called 'minimal' play.

A second possible relationship may occur between advanced forms of play and a high degree of interpersonal contact. This hypothesis is based on the theories of meta-communication (Bateson, 1972), the theory of 'secondary intersubjectivity' (Trevarthen and Hubley, 1978) and Trevarthen and Logotheti's (1987) description of awareness of symbols and play with symbols as a fundamental component of motivation for cooperation and communication leading to cultural understanding. Given that autistic children lack an important part of this motivation (Tomasello et al, 1993), it was expected that verbal autistic children would show differences in the category of 'symbolic' play compared to the developmentally-delayed and the non-delayed children, and that this would be related to the levels of interpersonal contact named 'communication' and/or 'no communication'. This hypothesis was not confirmed since no significant differences were found between the groups for these behaviours. Nevertheless, one can infer from the occurrence of interpersonal level of engagement named 'no response' (see Figure 7.5) that 'instrumental' and 'symbolic' play were not always fully shared since the verbal autistic children did not always respond to their mothers' initiatives.

The frequent association of 'instrumental' and 'symbolic' play with periods of 'communication' indicates that the autistic children, like normally developing children, may learn behaviours as a result of interaction with significant others (Mead, 1934), that maternal involvement serves as a 'scaffolding' for their learning (Bruner, 1975), that the mothers provide their emotional availability and supportive presence (Ainsworth et al, 1978), and that the mothers' support is active in an autistic child's communicated 'zone of proximal development' (Vygotsky, 1978) facilitating his/her play by 'guided participation' (Rogoff, 1990).

Verbal autistic children engaged with their mothers during 'instrumental' and 'symbolic' play, but they were 'not in communication' with them during 'exploratory' play. This could be a result of either or both of two factors: a) the mothers of the verbal autistic children were

less often in 'communication' during 'exploratory' play with their children compared to the other two groups, or b) 'exploratory' play, which involves more non-functional object use, is an activity that the children can manage on their own. We may conclude that verbal autistic children's mothers are important to them as supportive partners during more advanced forms of play, which they find difficult.

Although the hypothesis of an essential intersubjective motive behind 'symbolic' play was not fully confirmed in Study A, it was supported by the comparison between verbal and pre-verbal autistic groups. Mothers and pre-verbal autistic children were classified as minimally engaged during their 'symbolic' play and mothers with most affected children watched their children's symbolic activities less often. The pre-verbal autistic children were not only out-of-contact with their mothers, but they also failed to initiate symbolic acts that were directed to their mothers and to share objects with them. Furthermore, these children behaved in a very similar way during their 'instrumental' play. It may be concluded that a core motivation for cooperation and cultural understanding is affected to a varying degree in autism and that this is related to the level of linguistic and interpersonal skills of the child.

The consideration of the quality of the 'symbolic' play exhibited by mothers and children in all groups might also help to explain the presence of this play category in the verbal autistic group. The 'symbolic' play shown by children and their mothers in this corpus of tapes of play was mainly referential and restricted to single acts or to a short sequence of multiple acts, i.e. it involved object use or substitution of real objects for play. It did not involve true fantasy play or lead to imaginative story telling, fantasy performances and socio-dramatic play. Field, DeStefano and Koewler (1982) observed a progression from 'object-oriented' to 'person-oriented fantasy' play. They found that children at 2 to 3 years engaged more in 'functional' play, at 3 to 4 years they showed more 'object fantasy' play and at 4 to 5 years more 'person fantasy' play. Watson and Fischer (1980) also found differences in the quality of children's fantasy play according to their developmental level. By 2 years, most children could make a doll act as an independent agent (e.g. a doll is walking), by 3 years of age a doll could act a behavioural role (e.g. a doll is

a doctor), and at 4 or 5 years a social role (e.g. a doll is a doctor communicating with a doll patient). It might be that autistic children are not impaired in their 'functional' and 'object fantasy' play, but in 'person fantasy' or 'behavioural' and 'social' role play. These latter advanced forms of symbolic play were, in fact, not produced by either group.

One could raise the objection that the objects used in the study were realistic representational objects which might discourage 'symbolic' play in the sense of representing an object by something else (Baron-Cohen, 1987). However, object substitution or imaginary acts can be performed by 2- and 3-year-old children with objects similar or dissimilar to the signified objects, or with conventional objects, e.g. a rectangular block is used as a telephone receiver and a baby bottle is used for combing one's hair (Lowe, 1975; Elder and Pederson, 1978; Ungerer et al, 1981). There seems to be a decline in reliance on realistic objects in imaginative play after the age of 3 years (Fein, 1981), but results generally indicate that symbolic play does not necessarily rely on the support of form or function in its objects (Rubin et al, 1983).

The presence of the mother, and not a peer or sibling, as an interactive partner may have influenced the children's symbolic play. It has been found that pretend play with mothers is focused on replica objects and their functional use, while with siblings it frequently involves role playing and actions without reference to objects (Dunn and Dale, 1984; Dale, 1989). It was striking that in the analysis of the video data, occasionally when non-delayed children produced transformations of objects' meanings, their mothers did not accept their behaviour and corrected the child, e.g. the child used the grapes for peas and the carrots for sausages, but the mother requested the conventional label for these toys.

It might also be that the portion of the interactions selected for analysis did not constitute a homogeneous or representative sample. Non-delayed and delayed-children interacting with their mothers might develop an emerging strategy, changing in time; first they appeared to explore the environment, establishing a basic knowledge using didactic utterances (Dunn, 1985), afterwards entering into imaginative play. In contrast, the autistic group may have preferred to enter into more

advanced forms of play earlier in the session, probably because the mother felt a desperate need to use identifiable objects as compensation for the child's possible refusal to cooperate with a didactic message, or to prevent fatigue or off-task behaviour which would be expected to follow after a short period.

2.2. Communication

Apart from the issues raised concerning play, some interesting results were found in the communicative behaviours of the autistic children. The paucity of 'pointing' by these children confirms the findings of other studies during interaction with an experimenter (Mundy et al, 1986; Baron-Cohen, 1989a; Landry and Loveland, 1989) or the mother (Sigman et al, 1986). It was further found that 'pointing' is impaired to the same degree in both verbal and pre-verbal autistic children, which supports the hypothesis that 'joint attention' deficits underline the social impairment observed in autism.

The big differences emerging in Study A for the categories 'ask help/info' and 'positive reply' are consistent with the general finding that autistic individuals have difficulties in giving or requesting or sharing information (Wolff and Chess, 1965; Cunningham, 1968; Shapiro et al, 1972; Hurtig et al, 1982), although according to the Reynell language scores the verbal autistic children were as capable in language as the developmentally-delayed and the normally developing children. They also failed to 'laugh or smile' as frequently as their comparison groups. However, they very often tended to 'take' an object from their caregivers when none was offered to them. These data support the view of Rutter (1983) that while autistic children do not lack the ability to communicate their verbal or non-verbal messages by using categories such as 'give', 'offer', 'display', 'take', 'eye contact', 'inform' and 'converse', they lack the ability to maintain conversations and to engage in the kind of reciprocal exchanges that are observed with developmentally-delayed and normally developing children.

The pre-verbal children seem to be quite similar in this respect to the verbal autistic children, since no differences were found between the two groups of autistic children for the categories 'point', 'ask help/info'

and 'positive reply'. Additionally, the pre-verbal autistic children seemed to be impaired in categories denoting social interaction skills, in that they 'informed', 'conversed' and less often 'established eye contact' with their partners. It can be supposed that the lack of the first two categories is due to the lower verbal abilities of the pre-verbal group who compensated for this by using more non-verbal interpersonal messages, e.g. 'laughing or smiling', and by vocalizing very often. The problems that the pre-verbal autistic children had in reciprocal exchanges are also reflected in the quality of their responses. They generally gave fewer 'loose' responses than the verbal autistic children, indicating that they needed a very specific stimulus to trigger their response and that their communication is inflexible.

Although the mothers of the verbal autistic children used the same communicative behaviours as the mothers of the developmentally-delayed and the non-delayed children, some differences emerged in comparison with the communication of the mothers with pre-verbal autistic children. Mothers of pre-verbal autistic children regulated their children's behaviour more by 'giving objects' to them and using more 'directive' messages, in particular 'trying to attract the children's attention' and 'taking' objects from them. It is appreciated that this was a strenuous effort on the mothers' part to increase the responsiveness of the children who showed few initiations. Thus, mothers of pre-verbal autistic children did not 'react', 'assist', 'imitate', 'laugh or smile' and 'respond to eye contact' as often as mothers of verbal autistic children, because their children generally initiated less. The lack of communicative messages sent by the pre-verbal autistic children may have led the mothers to over-regulate and while playing pay minimal attention to the children's activities and utterances.

2.3. Interpersonal Engagement and Joint Attention

The mothers of verbal autistic children clearly attempted to initiate communication more often when there was in fact no contact with their children. This indicates the mothers' eagerness to motivate their children to participate, sometimes in synchrony or sympathy with them and other times not. Mothers' intrusive initiations in both studies cannot be described by communicative behaviours such as 'physically

hold', 'ask help/info' and 'ask to do' that can convey a message in a directive way. This is contradictory to the findings of Kasari, Sigman, Mundy and Yirmiya (1988) who suggested that caregivers of autistic children with similar abilities to those participating in Study A were more directive because they physically held their children on task. It is also not compatible with the view of Konstantareas, Zajademan, Homatidis and McCabe (1988) who reported that mothers of low functioning autistic children used more directives, in the form of suggesting activities and asking questions, compared to mothers of high functioning autistic children. It seems that the category 'mother initiates' is related to more subtle aspects of interpersonal contact, and to intersubjective experiences which are associated with the children's minimal involvement in communication and the mothers' shifts to another object, or another play activity or another conversational theme of interest. It may not be simply associated with directive verbal and non-verbal messages.

It was suggested above that the verbal autistic children are able to convey some communicative messages but they are deficient in using messages to share their attention with others and to participate in reciprocal interactions. In addition, they were overall involved significantly less often in communication with their mothers, compared with the developmentally-delayed and the normally developing children. As a result, mothers had to invent strategies to compensate for and cope with their child's difficulties. Sometimes they tried to follow what the child was doing and other times they made attempts to change the child's focus of interest to what they wanted them to do. Many times mothers failed to gain the desired responses, and possibly as a result they became more and more intrusive. Such a state of mind may be generated in a partner by an autistic person through past and present experiences of failure in communication. Although verbal autistic children were overall involved less in communication, they were not found to be impaired in initiating play or communication and this should have encouraged their mothers to carry forward the interaction based on the children's initiatives. Nevertheless, it seems that the autistic children's unresponsiveness and minimal involvement in communication triggered this kind of behaviour in their mothers.

Other studies have reported that mothers of hyperactive children (Cunningham and Barkley, 1979), children with Down's syndrome (Tannock, 1988) and developmentally-delayed children (Kogan, 1980; Cunningham et al, 1981; Eheart, 1982) tend to be directive and less responsive in comparison with mothers of normally developing children. In the present research no such differences were found among mothers of developmentally-delayed and non-delayed children. This phenomenon was observed only in the reaction of a familiar partner to an autistic child and, therefore, it is specific to the autistic syndrome with no link to the degree of mental retardation of the child.

A pattern of maternal behaviour facilitating communication through contingent initiatives appears in normal development. In interactions with 2 year olds, mothers are responsible for initiating joint attention because they readily pick up on their children's focus of attention, while termination of joint attention sequences is usually due to an act of the child (Rocissano and Yatchmink, 1984). When mothers are instructed to be directive with their 1- and 2- year olds children in a play situation, the maternal regulation is accomplished by subtle and indirect means depending on the mothers' sensitivity to the child's ongoing activity and on the child's chronological age (Schaffer and Crook, 1979).

The same pattern can be observed with autistic children. When child-preferred activities are chosen for engagement in interaction, these children show social avoidance behaviour less (Koegel et al, 1987). Unfortunately, when the mothers of verbal autistic children in the present study were trying to follow their children's initiatives they sometimes failed to gain a response while other times they succeeded. The fact that non-contingent initiatives dominated the mothers' behaviour in the autistic group, may not be the sole cause of them failing to gain a response. An alternative explanation, or level of analysis, could be that the mother failed to use the appropriate syntactic structures to facilitate the child's comprehension. Conversations of 10-year old autistic children with adults are reported to be facilitated when Yes/No questions are used, instead of questions commencing with

what/which/who, and the questions are conceptually simple and semantically contingent on the child's topic (Curcio and Paccia, 1987).

It may also be the particular way that the mother addressed her initiatives that caused the child to have problems in responding, since autistic children are found not to deny either compliance to requests (Volkmar et al, 1985) or responses to structured situations (Clark and Rutter, 1981). Volkmar, Hoder and Cohen (1985) express this point of view as follows:

> ". . . the impression of wilful noncompliance, or 'negativism', may reflect incorrect attributions on the part of caregivers, e.g. the child may understand that a request has been made but be unable to respond correctly and unable to reflect on this inability and request clarification . . . The widespread impression of 'negativism' in clinical settings may simply reflect greater rates of noncompliance in less structured settings." -- (Volkmar et al, 1985, p. 874).

The impact of the autistic child's difficulties in interpersonal contact with the mother is more profound on the 'interpersonal engagement' and 'joint attention' categories in the pre-verbal group. Overall, these mothers were less in 'communication' with their children because they did not 'watch their children's activities'. In this way, the mothers resembled their pre-verbal children by socially avoiding the contact with their children. Thus, the scheme of dialogue and of circular communication which is observed in normal interactions was replaced by two monologues. Mothers of pre-verbal autistic children also exhibited the category 'mother initiates' as much as mothers of verbal autistic children, or even more than the latter in 'exploratory' and in 'minimal' play, in addition to the 'directive messages' which they used. We may conclude that the mothers' tendency to initiate when there was in fact no interpersonal communication and to use directive messages depends on both the communicative and the intellectual abilities, or limitations, of the autistic child.

It might be objected that the filming situation caused the mothers to show the intrusive behaviour as a means to increase interaction with their children, and to prove that their children were able to play and communicate. This is unlikely because the mothers were not asked to

elicit play or communication from their children. They were simply asked to play with them naturally and in the usual way.

We suppose that a history of unmet maternal expectations, combined with a lack of support for coping with such a difficult child, is responsible for the mothers' interactive style. Several studies have identified stress (Wolf et al, 1989; Rodrigue et al, 1990) and even depression (Wolf et al, 1989), low attachment and low gratification (Hoppes and Harris, 1990) in mothers as a result of coping with an autistic child. Mothers tend to feel incompetent as parents because, as the child grows older, they increasingly realize that he/she does not respond or develop as was expected or hoped for (Bristol, 1984). The label 'autistic' given to a child can further undermine a partner's interactive style (Eikeseth and Lovaas, 1992).

The comments made above about the mothers' interactive style with their autistic children are only speculations because it is difficult to establish a cause and effect relationship. On the basis of the data discussed so far, it would be, in fact, legitimate to suggest that the less the children were communicative, the more mothers were intrusive. This does not mean that the mother is to be blamed for causing the child's autism, or that she was adopting a specific interactive style because of mental illness (groups were selected excluding the diagnosis of a psychiatric disorder in the mother and the family, see Chapter 4, Section 3: Selecting Children based on Descriptive Information Derived from the Subject Selection Inventory). It is is much more likely that the child's autism provokes the mother's intrusive behaviour which in turn will not help the establishment of a communicative circle. It is to be hoped that by helping the mothers to focus more accurately on the children's behaviours that the degree of their interpersonal contact might be increased.

3. Implications of the Findings for Improving Communication

The findings have shown that play, communication and interpersonal engagement of autistic children deviate from the course of normal development. How might this be corrected? Intervention approaches have been used for training play skills with autistic children (Rogers et al, 1986; Coe et al, 1990; Dawson and Galpert, 1990). Communication training for them has a long history, mainly focusing on language, without taking into account interpersonal aspects of communication. It is probably for this reason that no encouraging improvements have been reported over the last 25 years (Howlin, 1989). The findings of the present study have shown that disruptions in communication originate not only from the child, but from the mother as well.

Some attempts to train non-verbal and verbal skills to autistic children with adult models have been successful (Coe et al, 1990). Parents also have devised their own ways to assist an autistic child. For example, Kaufman and Kaufman (1976) developed the 'Option Method' from efforts to help their son. They used exaggerated responses and imitation to engage the child and to provide an interesting and interested social environment.

3.1. A Possible Way to Improve Mothers' Interactive Communication

Several techniques have been proposed to remedy the faults in communication observed between autistic individuals and their mothers or other adults by focusing more on altering the adults' interactional style (Duchan, 1983). Various common features of maternal behaviour that can facilitate communication based on evidence from experimental studies and intervention programs could be applied. These features include:

1) delay of initiations until the child responds or initiates communication (Koegel and Johnson, 1989)
2) imitation (Dawson and Adams, 1984; Dawson and Galpert, 1990; Nadel and Pezé, 1993)
3) repetition of phrases, silencing during pauses and gameplaying attention-getting, e.g. "I am going to get you" (Field, 1983)
4) responding to what the child is saying or doing rather than continuously criticizing and questioning the child (Duchan, 1983) or use of child-centered initiatives (Hupp et al, 1992)
5) use of songs rather than speech (Klin, 1991) and the form of prosody associated with motherese (Santarcangelo and Dyer, 1988)
6) use of sensory stimuli involving simple information (Burke and Cerniglia, 1990).

Among various interventions applied by researchers for improving the communication of an autistic child, -- such as sign language, holding therapy, music therapy, facilitated communication, the Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH programme) and medical treatments (Aitken et al, 1993), parents have been proved to be capable of providing appropriate treatment for their children. Mothers have been used as behaviour therapists for their own children (Wahler et al, 1965; Schopler and Reichler, 1971) and home-based programmes for helping autistic children and their parents have been designed (Howlin and Rutter, 1987). The programmes focusing on parent training have included instruction methods, behavioural rehearsal and feedback, and modelling procedures, either live or videotaped. The last method has been shown to be superior to the other procedures (Schreibman et al, 1984) and videotape feedback highlighting successful and unsuccessful initiations can result in an increase of social interaction in autistic children (Oke and Scrhreibman, 1990).

Video Hometraining is a technique similar to Video Feedback or Video Tape Recorded Playback (see Chapter 3, Section 1: Aims of the Pilot Study). It was developed in 1987 by Harrie Biemans of the

Foundation for the Promotion of the Intensive Home-based Treatment[2] (SPIN) to give intensive help to families with disturbed children by means of guided viewing of video recordings of communication in the home. I had the opportunity to visit SPIN for two weeks in November 1990, and I observed closely their intervention program with the intention of applying an adaptation of the method for intervention with two children communicating with their mothers. It was very obvious during the Pilot Study and the collection of the data in the Main Study that the mothers of the autistic children were attempting to initiate communication unsuccessfully with the use of non-contingent cues. This project has not been concluded, for reasons of time, but it is worth recording here that pilot work and my personal experience with these two children suggest encouraging results.

The aim of Video Hometraining is to teach the parents and the other members of the family, e.g. siblings, grandparents, how to achieve successful communication with a disturbed child. For this to be possible, it is important to know the characteristics of successful interaction.

Once the institution (assessment unit, day care centre, residential centre, children's home) decide that the family might benefit from hometraining, a first appointment is arranged with the parents. The hometrainer visits the family and a tape of the normal communication in a family is shown to introduce the method and the principles of hometraining. A very high proportion of the families, 80 to 90%, agree to cooperate with hometraining.

Hometraining lasts 3-4 months on average, and there is a follow-up 3 months later to check if the family is keeping the principles. The hometrainer usually visits the family once a week, but visits may be more frequent at the beginning if the problems are severe. The hometrainer films routine family life (e. g. dinner time, play situations, bath time and bed time) and the next week reviews the film with the parents and older sibling(s). The filming situation is decided by the family, or it can be arranged at the hometrainer's request.

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2 Address: SPIN, Witte Vrouwensingel 27, 3581 GC Utrecht, The Netherlands.

The hometrainer can model communication with the child to give the parents a real paradigm of how a positive interaction can be applied. He can film himself during modeling and review this tape with the parents at the next week's meeting. The hometrainer can also help the interaction of the family while he/she is behind the camera; when he/she feels that there is a conflict or one member of the family has been neglected during the filming situation, he/she intervenes and tries to bring a balance using the principles of the scheme of successful contact that is outlined in the following table.

Table 7.1: Scheme of Successful Contact During Video Analysis

'YES' ROW	POSITIVE INITIATION OR RESPONSE
attention	turn towards someone look towards someone
approval	friendly postures friendly intonations say 'yes' friendly facial expressions
conversation	chat name what the child is doing say what the child is allowed to do initiate mention/discuss ask
turn - taking	give turns - take turns
cooperation	give - take give help - ask for help
guidance	take initiations state what it is happening make proposals make plans search for solutions

Once the film has been made, the home trainer views it by himself/herself frame-by-frame, determines which elements should be mentioned to the parents and discusses with his/her supervisor about how he/she should proceed. Having decided which items of the contact scheme should be increased, the home trainer uses still video pictures to

show these to the parents identifying and emphasizing positive aspects of the parental behaviour so that he/she can persuade them that they are doing well and that they should work on that more in the future.

Van Rees and Biemans (1986) showed in a demonstration video summarizing video hometraining that a child with primary autism can respond to, and benefit from, a carefully adjusted and sustained regime of communication and play in which the mother benefits by guided interpretation of her behaviours and the child's responses. Review of videos of interaction with an autistic child can help parents or teachers gain insight into the child's behaviour and the adequacy or efficacy of their own behaviours.

4. Directions for Future Research

This thesis has raised several issues which will need further research before any firm conclusions can be reached. Autistic children are a fascinating group and there are many more aspects of behaviour that we can still explore with them. This thesis has identified and carefully defined the characteristics of autistic children and has developed a detailed coding scheme for the analysis of interactions with them. It has provided a framework for finding out about play, communication and communicative play of autistic children with different linguistic and cognitive abilities.

There is a great need to break away from the common direction of research in autism. Lately, there has been a strong focus on the theory of a 'theory of mind' impairment, but this takes into account only the cognitive aspects of social impairment. It is my belief that the more immediate interpersonal aspects of communication should also be studied because these are fundamental for human development. Now that a start has been achieved, some of the next steps are to provide a more complete account of these interpersonal aspects. The following additions and modifications of research method are suggested:

- Other communicative partners, not only adults but children, siblings or peers should be included.
- The relationship of interpersonal processes to cognitive abilities and emotional expressions requires further examination.

- Verbal autistic children should be matched with developmentally-delayed children on both general cognitive skills and linguistic abilities to control for the effects of both general intelligence and verbal abilities.
- Pre-verbal autistic children should be compared not only with verbal autistic children but also with matched control groups of developmentally-delayed and non-delayed children on both general cognitive skills and linguistic abilities to strengthen the present findings.
- Autistic children functioning at a language level of a 4 to 5 years old child should be studied to find out if their 'symbolic' play with a partner is impaired at the level of more complex forms, such as 'fantasy' play, or story telling.
- The composition of the groups should be extended to include more dyads in order to be able to generalize the present findings.
- The coding instrument requires revision on the basis of the significant results that were obtained, and in the light of the experience acquired during the analysis of all the tapes. Microanalysis is a time consuming and tiring procedure, but it is a necessary first stage before an effective macroanalysis can be undertaken. At the macroanalytic level, the causal relationship of the significant results could be studied, categories which did not prove to have great functional use could be rejected while important ones can be re-defined in more detail, and longer periods of time could be analyzed. For example, the category 'mother initiates' could be enlarged to include the coding of grammatical structure as well as content of information.
- An exploration of how interpersonal play and communication change longitudinally will elucidate the developmental processes taking place in the autistic children.
- The interactions of the mothers of the autistic children with those of their normally developing children should be compared, to establish if the mothers' behaviour is a cause or an effect of the children's autism, or both.

The best way to carry out further research on the above points would be to survey a number of autistic children in a large geographical area where the recruitment of all young autistic children is feasible. It should be noted that the subject recruitment, the procedure of equating participant groups and the analysis of the videotapes is bound to be very time consuming and expensive. Future research might expand the study of interactions by including other adults, such as teachers, and by incorporating the evaluation of intervention programmes for helping mothers and teachers to facilitate the communication with their children.

5. Concluding Remarks

Several important conclusions have emerged, but one has to be cautious about generalizing from these findings, given that the observation time per dyad was necessarily brief, due to the time demands of microanalysis, and that only a few dyads were studied.

Autistic children are capable of advanced forms of play, such as 'instrumental' and 'symbolic' play depending on the level of their language abilities and intellectual functioning. They are also able to communicate some of their messages but they are specially impaired in those which convey a sharing and reciprocating meaning of information with their partners. Their partners, in this case mothers, can be supportive and sensitive to their children's needs during play, but the way that they try to involve their children in communication deviates from common strategies and unfortunately does not always lead to successful interactions. Hopefully, this is a behaviour which can be modified with appropriate intervention programmes by encouraging the mother to be more positive and to follow the children's initiations.

The limitations of the present study are appreciated and, therefore, some recommendations have been made for future more extensive research.

CHAPTER 8 RECAPITULATION

In this final chapter, I will bring together the arguments proposed in the Literature Review (Chapter 2) and the discussion of the findings as presented in the previous chapter in an attempt to summarize the aims and the findings of this thesis within a framework of theory on children's interpersonal or intersubjective contact.

1. HAVE THE AIMS OF THIS THESIS BEEN FULFILLED?

Several questions were raised in the beginning of this thesis (see Chapter 2, Section 8: Towards a Synthesis). One of the main aims of the present investigation was to demonstrate the usefulness of a particular framework for conducting research with autistic individuals that considers the interpersonal aspects of human development rather than the perceptual or representational aspects considered of primary importance in cognitive approaches.

1.1. A Strategy of Research to Test Application of an Intersubjective Model

Criticism was made, on both methodological and theoretical grounds, of the empirical studies which have been so far carried out on play and communication with autistic children.

Evidence was adduced from normal development during infancy and early childhood to define an interpersonal framework for analysis and a Pilot Study was carried out to test the extent to which an interpersonal model could be applied. Some useful observations were made that helped in the design of a Main Study.

Participant groups were selected initially by means of original Subject Selection Inventories. The composition of the groups proved to be successful for Study A, in which the groups were appropriately matched. However, in Study B, no attempt was made to match the pre-verbal autistic group with a developmentally-delayed and a non-delayed

group. This study was more an attempt to bring evidence that autistic children with differing degrees of impairment function in different way, and to make the point that researchers should be cautious about generalizing their findings and attributing deficits from one sample, e.g. verbal individuals, to the whole autistic population.

In order to examine the interpersonal aspects of behaviours, a suitable observational method had to be set up and an appropriate coding instrument for analysing the video data had to be developed. Mothers were asked to participate as interactive partners. A mother is the most familiar person in the world of their autistic child and she, therefore, would be expected to elicit the child's full interactional potential. A second reason for this choice of partner was related to availability, since data had to be collected within a very short period and intensive attendance was required. Mothers, generally, are available to accompany their children.

Considering communication as a system, the instrument devised for videoanalysis gave emphasis not only to how the children interacted or failed to interact but also to how their mothers responded or failed to respond, and the converse. This instrument was simple, in the sense that it tried to capture almost every detail observed during the interaction making the procedure of recording behaviours very sensible and logical. On the other hand, it was complicated because multiple categories had to be recorded at the same time. Even though a condensed system was developed, its complexity made the statistical analysis of the results difficult and a few initially interesting questions had to be omitted. Another inhibitory factor was the low occurrence of some categories. Some statistical tests which appeared appropriate for examining these questions eventually did not prove applicable. For example, the aspect of 'communicative play' was intended to be examined not only by means of 'Interpersonal Engagement', but also by associating categories of 'Communication' with categories of 'Play'.

The above practical issues were resolved by using appropriate statistical tests so that results could be obtained for a discussion of autistic behaviour at the qualitative level of interpersonal experiences between a 'Self' and an 'Other'.

1.2. An Intersubjective Model for Autism

Research with infants has shown that two- to three-month-olds communicate with their mothers with refined synchrony, reciprocity and complementarity of expressions, and older babies gain increasingly elaborate capacities for play. Infants of 3-8 months old show exploratory behaviour with objects and by one year a baby is capable of cooperation in simple arbitrary tasks and has a well-developed sense of a performing social 'Me' (Trevarthen, 1979b). Further in the second year of life symbolic play emerges. Children play with their mothers, acting sometimes according to her suggestions and developing conversations with her (Trevarthen and Marwick, 1982). It seems clear that the development of the representational capacity, which accelerates in symbolic play during the second year, has its origins in the affective and cooperative pattern of communication with familiar persons that grows in the first year. These observations on the interaction between a mother and her child have been incorporated by Trevarthen in an intersubjective theory of play and communication.

Autism has been considered as a developmental consequence of failure in interpersonal or intersubjective relatedness. Cognitive and affective theories agree about this point of view but the explanation they give differs. Cognitive theorists like Baron-Cohen, Frith and Leslie explain autistic children's difficulties in conceiving the state of 'Other' as a lack of the capacity for acquiring 'a theory of mind', i.e. mentally representing representations about objects, beliefs, desires and emotions. Recently, there has been a tendency to placate the opponents of the affective approach, like Hobson (Hobson, 1990a) who claims that autistic people do not acquire a theory of a 'theory of mind' but knowledge that other people have minds. Thus, early precursors to a 'theory of mind' have been identified (Baron-Cohen, 1993) such as understanding the mental state of attention (proto-declarative pointing) and goal (direction of gaze). Proto-declarative pointing and eye contact have both been considered to be part of the most fundamental elements of intersubjective motivation. However, the emphasis has not been on the 'mental state' but on the immediacy of the interpersonal aspects of communication.

Communication is two-fold, being mediated by the 'Self' who has a 'Virtual Other' in its mind and the 'Actual Other' (Bråten, 1992), and is established on the analogy between the experiences of the 'Self' and the ostensible expressions of the 'Other' (Hobson, 1990a). When this analogy has been achieved a successful circular scheme in communication appears as is demonstrated in Diagram 8.1. We have seen in the discussion of the present thesis (Chapter 7) that this circular scheme is disrupted in the case of autism and has been replaced by either the absence of communication (Diagram 8.2) or unsuccessful intrusive behaviour from the mother (Diagram 8.3). Communication (Diagram 8.1) is characterized by feedback of information about the same object(s), by a shared focus of interest and involvement in the same play theme. In contrast, when the partners are not in communication (Diagram 8.2) a shared focus of interest has not been established and solitary play is observed or interpersonal contact is identified in activities which were parallel but slightly irrelevant. Often the most experienced and efficient partner, the mother, would try to break in the child's monologue by inviting the child to change his/her primary interest into something totally new. Unfortunately, the child does not respond to this invitation remaining involved in his/her own interest.

We can speculate that when the establishment of intersubjective experiences is not successful different processes are taking place in both child and mother; the child has the subjective experience but he/she is lacking the concept of the 'Virtual Other', while the mother has the 'Virtual Other' but is unable to materialize it into an 'Actual Other'. Therefore, the circle of communication is separated into smaller circles ending into 'Self' and acting independently and in parallel; each of them is dominated by the agency of either mother or child. The other possibility is that the mother tries to revive the lost communication by leaving her solitary circle and intervening in the child's solitary circle. Unfortunately, this attempt can very frequently lead to an unsuccessful transition from the intrapersonal to the interpersonal level.

Diagram 8.1: Communication

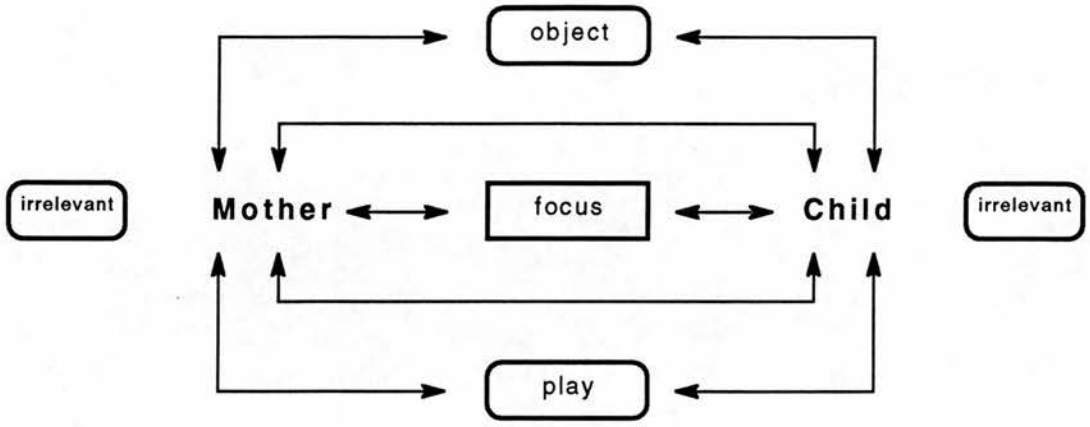


Diagram 8.2: No Communication

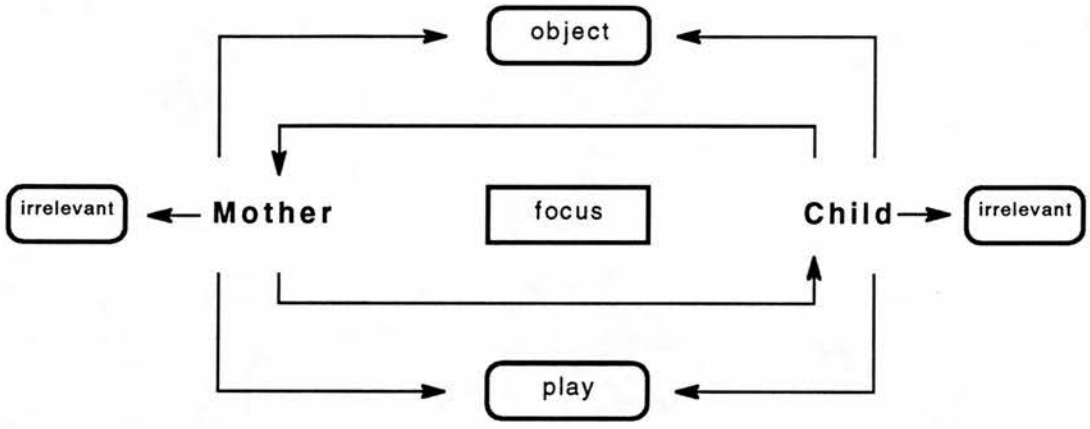
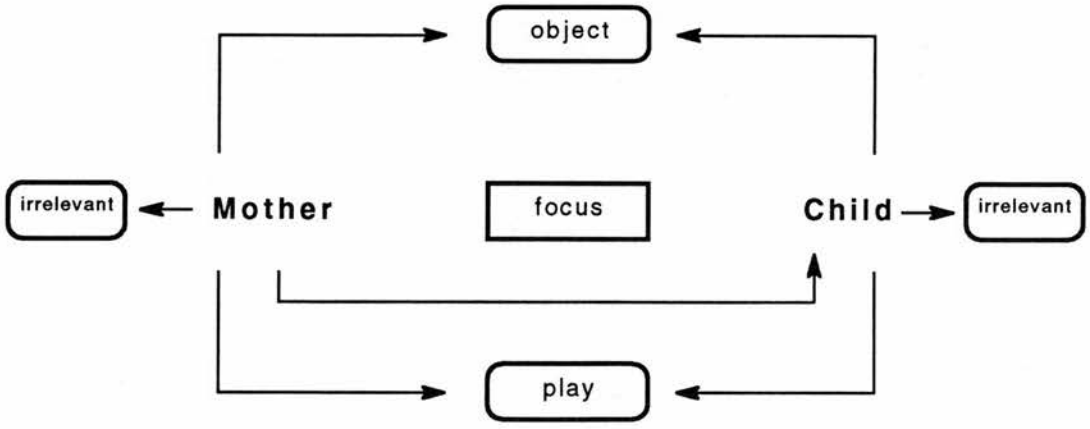


Diagram 8.3: Mother's Unsuccessful Intrusive Behaviour



The quality of interpersonal contact is tightly linked with the development of play which has been viewed exclusively as a cognitive process. In the case of able autistic children, reciprocal communication and the interpersonal level of play can be more affected than their actual play. Furthermore, these children were capable of participating in symbolic play because their communication was more advanced than the pre-verbal children's. It could, therefore, be suggested that communication, including verbal and non-verbal means, is a precursor to the development of play and to symbolic processes. This is a main area affected in the autistic population but to varying degrees. However, symbolic processes which are fundamental elements of motivation for cooperation and communication leading to cultural understanding can be facilitated by successful intersubjective experiences.

These speculations, indeed, do not support a theory of a 'theory of mind' explanation about the psychological nature of autism. They are more compatible with a theoretical framework that sees autism as a result of failure in interpersonal relatedness (Hobson, 1989b), in the core mechanisms of the brain regulating interpersonal communication (Trevarthen, 1988) and in a neuropsychological system affecting interpersonal coordination (Rogers and Pennington, 1991).

It has not been my intention by having emphasized the interpersonal processes and the breakdowns in communication to blame the child or his/her mother. It is my personal view that a child with autism is by nature affected in communicating his/her thoughts, feelings and emotions and therefore communication problems are to be expected. Similarly a mother's difficult position is respected. The significance of the intersubjective model is encapsulated by a mother's confiding comments after reviewing videos of herself playing with her child.

> *I don't think one should be frightened to look at herself as a failure. You are not a failure. It is just you are under strain and you are not aware of what you are doing.*

I. A. SUBJECT SELECTION INVENTORY FOR AUTISTIC CHILDREN USED IN THE PILOT STUDY

Date of completion ..... / ..... / .....

CHILD

Name: .....

Sex: .....

Date of birth: .....

Age: .....years.....months

Date that the child was first referred: ..... / ..... / .....

Please state the reason (if known): .....

.....

Age of onset (if known): .....years.....months

Ordinal Position in family: .....

Did the mother have a normal delivery? Yes / No

If no, please specify .....

.....

Is the child full-term? Yes / No

If no, please specify .....

.....

Does the child have a history of illness? Yes / No

If yes, please specify .....

.....

Is any history of neurological abnormality? Yes / No

If yes, please specify .....

.....

Is any history of brain pathology? Yes / No

If yes, please specify .....

.....

Diagnosis:.....

.....

Criterion used: .....

Made by:.....

Mental Age: *Formal tests*

.....on.....

.....

.....on.....

.....

Clinical assessment

.....

.....

.....

.....

Additional comments: .....

.....

.....

FAMILY

Social class: .....

Geographical district: .....

Other children: .....

age.....

Do the parents live together? Yes / No

If no, please specify .....

.....

Do other people live within the household? Yes / No

If yes, please specify .....

.....

Does the family belong in a ethnic minority group? Yes / No

If yes, please specify .....
and give information for the language spoken .....

.....

Are any other language spoken in the household? Yes / No

If yes, please specify .....

.....

Mother

Age: .....

Education: School leaving age: .....

Years at school: .....

Further education: ..... Yes / No

Occupation: .....

Does the mother have a history of physical illness or handicaps? Yes /No

If yes, please specify .....

.....

Does the mother have a history of diagnostic psychiatric illness? Yes / No

If yes, please specify .....

.....

Is the mother the primary caregiver? Yes / No

If no, please specify .....

.....

Is the mother the natural mother? Yes / No

If no, please specify .....

.....

Father

Age: .....

Education: School leaving age: .....

Years at school: .....

Further education: ..... Yes / No

Occupation: .....

Does the father have a history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Does the father have a history of diagnostic psychiatric illness? Yes / No

If yes, please specify .....

.....

Is the father the natural father? Yes / No

If no, please specify .....

.....

Additional comments: .....

.....

.....

Siblings (if any)

Do the siblings have a history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Do the siblings have any history of psychiatric / emotional disorder? Yes / No

If yes please specify .....

.....

Do the siblings have learning difficulties? Yes / No

If yes, please specify .....

.....

Occupation(if adult): .....

Do the siblings live at home? Yes / No

Additional comments: .....

.....

.....

COMMUNICATION DISORDER PROGRAMME

When did the child start treatment? Partial: from ..... / ..... / .....

to ..... / ..... / .....

Full: from ..... / ..... / .....

to ..... / ..... / .....

When do you hope that the treatment will be terminated? ..... / ..... / .....

How often does the child at present time join the:

Yes / No clinical psychologist .....min. per time .....days per week

Yes / No teacher .....min. per time .....days per week

Yes / No speech therapist .....min. per time .....days per week

Yes / No occupational therapist .....min. per time .....days per week

Yes / No music teacher .....min. per time .....days per week

Yes / No nursery school .....min. per time .....days per week

Please state the days on.....

.....

Does the mother consult the psychiatrist? Yes / No

If yes, please specify .....

.....

Does the mother consult the social worker? Yes / No

If yes, please specify .....

.....

Does the mother join sessions with the therapists? Yes / No

If yes, please specify .....

.....

Does the mother receive training services? Yes / No

If yes, please specify .....

.....

Does the mother make use of the Com. Dis. Prog. at home? Yes / No / Not known

If yes, please spescify: .....

.....

Additional comments: .....

.....

.....

Please circle the number corresponding to the word which most accurately describes the child's present performance, relative to your experience and the other children in the Communication Disorder Programme, and add any information that you consider appropriate.

COMMUNICATION

Does the child have problems in receptive language? Yes / No

If yes, please specify .....

.....

Is the child mute? Yes / No

If yes, please go to the next section.

	1.never	2.seldom	3.occasionally	4.frequently	5.ever
Is the language characterised by :					
spontaneous speech	1	2	3	4	5
vocal sounds	1	2	3	4	5
naming of objects, persons	1	2	3	4	5
immediate echolalia	1	2	3	4	5
delayed echolalia	1	2	3	4	5
prenominal reversal	1	2	3	4	5
verbal rituals	1	2	3	4	5
idiosyncratic utterances whose meaning is clear only to those who are familiar with the child's past experiences	1	2	3	4	5
abnormal tone and rhythm in speech	1	2	3	4	5
clear articulation and phonation	1	2	3	4	5
Does the child use facial expressions?	1	2	3	4	5
Does the child understand facial expressions?	1	2	3	4	5
Does the child use gestures?	1	2	3	4	5
Does the child understand gestures?	1	2	3	4	5

Additional comments: .....

.....

.....

1.never 2.seldom 3.occasionally 4.frequently 5.ever

RELATION TO PEOPLE

Does the child have good eye-contact?	1	2	3	4	5
Does the child smile?	1	2	3	4	5
Does the child respond when is being addressed?	1	2	3	4	5
Does the child show anticipation when is being picked up?	1	2	3	4	5
Is the child cuddly?	1	2	3	4	5
Is the child occupied with parts of the other persons body rather than with the whole person?	1	2	3	4	5
Does the child push people away when they come too close?	1	2	3	4	5
Does the child notice people's coming?	1	2	3	4	5
Does the child prefer to be alone?	1	2	3	4	5
Does the child initiate communication?	1	2	3	4	5
Does the child relate with the other children?	1	2	3	4	5
Is the child's play solitary rather than cooperative?	1	2	3	4	5
Is the child's play ritualistic rather than imaginative?	1	2	3	4	5
Does the child show appropriate emotional reaction?	1	2	3	4	5

Additional comments: .....

.....

.....

1.never 2.seldom 3.occasionally 4.frequently 5.ever

RELATION TO OBJECTS

Does the child show unusual use of objects? (lines up objects, spins, makes noises, twirls)	1	2	3	4	5
Does the child show bizarre treatment of objects? (e.g. mouthing, smelling)	1	2	3	4	5
Is the child attached to objects? (e.g. holds things in hands, takes things to bed)	1	2	3	4	5
Is the child destructive?	1	2	3	4	5

Additional comments: .....

.....

.....

GENERAL BEHAVIOUR

Does the child produce repetitive actions?	1	2	3	4	5
Does the child insist on sameness? (gets upset by any change of an accustomed pattern)	1	2	3	4	5
Does the child show self-stimulation behaviour? (e.g. hand flapping, rocking, occupied with his body)	1	2	3	4	5
Is the child overactive to certain sounds or objects?	1	2	3	4	5
Does the child act as if deaf?	1	2	3	4	5
Does the child show hyperactivity rather than apathy?	1	2	3	4	5
Does the child have temper tantrums?	1	2	3	4	5

Does the child show special skills? Yes / No

If yes, please specify .....

.....

Does the child have abnormalities in eating? Yes / No

If yes, please specify .....

.....

Does the child have abnormalities in sleeping? Yes / No

If yes, please specify .....

.....

Additional comments: .....

.....

.....

I. B. CONSENT FORM USED IN THE PILOT STUDY

CONSENT TO VIDEO AND TAPE RECORDINGS

Dear _____

May I take this opportunity to introduce myself.

My name is Despina Papoudi and I am a postgraduate student in psychology.

The research for my Ph.D. thesis will be carried out at Yorkhill Hospital in Glasgow. I am interested in how preschool children communicate with their mothers during sessions recorded both at the hospital and at home. I also want to find out how viewing of recordings can help a mother and a child to improve their communication.

I would be grateful if you would help me in this research project. I assure you that the data derived from the research will be carefully used only for scientific study and for your own reference if you wish; your privacy will be respected at all times. Surnames of mothers and children will not be reported.

If you decide to join in the study could you please help by completing this form.

Your cooperation will be a great help to my study and I would like to give you my warmest thanks in advance. If you would like a copy of the recordings of your sessions I would be pleased to arrange this for you.

I look forward to meeting you soon.

Yours sincerely

Despina Papoudi Consultant Psychiatrist

I agree that the video and the tape recordings can be used for the above mentioned Ph.D. research. It is understood that once the video and the tape recordings have been made and I am aware of their content, I will be asked to give my consent whether or not I would like them to be used for publications, lectures, seminars, and discussion with professional colleagues. I understand that any time I may withdraw my consent and/or ask any part of the recordings to be erased.

Name: _____

Signature: _____

Date: _____

I. C. NOBLE SEMANTIC DIFFERENTIAL MEASURE

Here is some information how you can complete the following form.

If you feel that the concept is *very closely related* to one side as opposed to the other side, you should place your check-mark as follows:

Young X ___ ___ ___ ___ ___ ___ Old

OR

Young ___ ___ ___ ___ ___ ___ X Old

If you feel that the concept is *quite closely related* to one side as opposed to the other side, you should place your check-mark as follows:

Young ___ X ___ ___ ___ ___ ___ Old

OR

Young ___ ___ ___ ___ ___ X ___ Old

If you feel that the concept is *only slightly related* to one side as opposed to the other side, you should place your check-mark as follows:

Young ___ ___ X ___ ___ ___ ___ Old

OR

Young ___ ___ ___ ___ X ___ ___ Old

The direction toward which you check depends upon which of the two ends of the scale seem most characteristic of the concept you are judging.

If you feel that the concept is *neutral or completely irrelevant*, you should place your check-mark as follows:

Young ___ ___ ___ X ___ ___ ___ Old

IMPORTANT

1. Place your check-mark on the middle of the spaces, not on the boundaries.

This Not this

___ X ___ ___ ___ X ___ ___

2. Please complete all the lines for each scale.
3. Do not put more than one check-mark on a single line.
4. Please do not look back and forth through the pages.
5. Do not worry or puzzle over individual items; I want your first impressions.
6. Try to complete the form in five (5) minutes.

Many thanks.

'ME'

Young	___ ___ ___ ___ ___ ___ ___	Old
Robust	___ ___ ___ ___ ___ ___ ___	Delicate
Warm	___ ___ ___ ___ ___ ___ ___	Cold
Weak	___ ___ ___ ___ ___ ___ ___	Strong
Outgoing	___ ___ ___ ___ ___ ___ ___	Quiet
Passive	___ ___ ___ ___ ___ ___ ___	Active
Competent	___ ___ ___ ___ ___ ___ ___	Incompetent
Relaxed	___ ___ ___ ___ ___ ___ ___	Tense
Sad	___ ___ ___ ___ ___ ___ ___	Happy
Valuable	___ ___ ___ ___ ___ ___ ___	Worthless
Kind	___ ___ ___ ___ ___ ___ ___	Cruel
Beautiful	___ ___ ___ ___ ___ ___ ___	Plain

'MYSELF AS MOTHER'

Hard	___ ___ ___ ___ ___ ___ ___	Soft
Tense	___ ___ ___ ___ ___ ___ ___	Relaxed
Active	___ ___ ___ ___ ___ ___ ___	Passive
Kind	___ ___ ___ ___ ___ ___ ___	Cruel
Happy	___ ___ ___ ___ ___ ___ ___	Sad
Weak	___ ___ ___ ___ ___ ___ ___	Strong
Valuable	___ ___ ___ ___ ___ ___ ___	Worthless
Warm	___ ___ ___ ___ ___ ___ ___	Cold
Outgoing	___ ___ ___ ___ ___ ___ ___	Quiet
Competent	___ ___ ___ ___ ___ ___ ___	Incompetent

'MY CHILD'

Content	___ ___ ___ ___ ___ ___ ___	Discontent
Delicate	___ ___ ___ ___ ___ ___ ___	Robust
Outgoing	___ ___ ___ ___ ___ ___ ___	Quiet
Tense	___ ___ ___ ___ ___ ___ ___	Relaxed
Active	___ ___ ___ ___ ___ ___ ___	Passive
Weak	___ ___ ___ ___ ___ ___ ___	Strong
Competent	___ ___ ___ ___ ___ ___ ___	Incompetent
Happy	___ ___ ___ ___ ___ ___ ___	Sad
Cold	___ ___ ___ ___ ___ ___ ___	Warm
Valuable	___ ___ ___ ___ ___ ___ ___	Worthless
Kind	___ ___ ___ ___ ___ ___ ___	Cruel
Beautiful	___ ___ ___ ___ ___ ___ ___	Plain

'MY RELATIONSHIP WITH MY CHILD'

Close	___ ___ ___ ___ ___ ___ ___	Distant
Strict	___ ___ ___ ___ ___ ___ ___	Permissive
I always lead when we do anything together	___ ___ ___ ___ ___ ___ ___	I never lead when we do anything together
My child leads when we do anything together	___ ___ ___ ___ ___ ___ ___	My child never leads when we do anything together
Weak	___ ___ ___ ___ ___ ___ ___	Strong
Relaxed	___ ___ ___ ___ ___ ___ ___	Tense
Valuable	___ ___ ___ ___ ___ ___ ___	Worthless
Active	___ ___ ___ ___ ___ ___ ___	Passive
Bad	___ ___ ___ ___ ___ ___ ___	Happy
Warm	___ ___ ___ ___ ___ ___ ___	Cold
Hard	___ ___ ___ ___ ___ ___ ___	Soft
Pleasant	___ ___ ___ ___ ___ ___ ___	Unpleasant

Completed by: _____

Date: _____

I. D. QUESTIONNAIRE TO BE COMPLETED BY THE MOTHERS AFTER THE VTRP

Do you think that this is a representative sample of the natural interaction with your child?

.....

.....

.....

Do you think that you had enough time to play with your child?

.....

.....

.....

What do you think about your child?

.....

.....

.....

What do you think about yourself?

.....

.....

.....

What do you think about the relationship with your child?

.....

.....

.....

Would you like to comment on how you are yourself?

.....

.....

.....

What did you feel while you were watching the tape?

.....

.....

.....

How did you feel the experience of watching yourself in interaction with your child?

.....

.....

.....

What did you like about the interaction with your child?

.....

.....

.....

What did you dislike about the interaction with your child?

.....

.....

.....

Is there anything that you would have liked to change?

.....

.....

.....

Where do you think that the strength of the communication with your child lie?

.....

.....

.....

Do you think that future films will show any change?

.....

.....

.....

Is there anything that you would like to add?

.....

.....

.....

II. A.1. SOURCES OF ITEMS IN THE SUBJECT SELECTION INVENTORY FOR AUTISTIC CHILDREN OF THE MAIN STUDY

Name.	*CDRU*[1]
Sex.	*CDRU*
Date of birth.	*CDRU*
Age in years and in months.	*CDRU*
How old was your child when you first became upset about his/her behaviour?	*CDRU*
Has the child ever been diagnosed as 1) autistic or 2) having autistic features or 3) other diagnosis.	*CDRU*
Date that the child received such a diagnosis.	*CDRU*
If 1 or 2 who diagnosed that the child is autistic or has autistic features? G.P.or Health Visitor or Educational Psychologist or Clinical Psychologist or Speech Therapist or Other professional(s) or Family / Friends or Other(s).	*CDRU*
Of the above professionals, who confirms that the child is autistic?	*CDRU*
Please circle any of the above professionals from whom there is a written report.	*CDRU*
Would you mind if I obtained a copy of this report?	*CDRU*
Has the child been 'statemented'?	*CDRU*
Do you have a copy of the statement of special need?	*CDRU*
Does the statement mention autism/autistic features?	*CDRU*
Would you mind if I obtained a copy of the statement?	*CDRU*
Does the child attend a nursery school?	
Does the child attend a primary school?	
If yes, please state name of the school.	

---

[1] CDRU: questionnaire developed by the Child Development Research Unit in the University of Nottingham for the identification of autistic individuals at schools and hospitals.

If yes, please state frequency of attendance.

Is the child in treatment?

If yes, please state kind of treatment.

If yes, please state place of treatment

If yes, please state frequency of treatment

Does the mother or any other member of the family receive training for the management of the child's behaviour?

Please state ordinal position of the child in the family.

Was the delivery normal? *KANNER*[2]

Is the child full-term? *KANNER*

Was the child ever thought to be deaf? *KANNER*

Has the child a hearing problem now? *KANNER*

Does the child have a history of illness or handicaps?

Is there any history of neurological abnormality?

Is there any history of brain pathology? *KANNER*

FAMILY

Other children

Age

Sex

Are both parents living with the family?

Do other people live within the household? *KANNER*

Does the family belong in a ethnic minority group?

If yes, please specify and give information about the language spoken.

Are any other languages spoken in the household?

---

2 Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child*, **2**: 217-220.

Mother

Age.

Nationality.

Please state school leaving age.

Please state years at school.

Please state further education.

Please state occupation.

Does the mother have a history of physical illness or handicaps? *KANNER*

Does the mother have a history of diagnostic psychiatric illness?

Is the mother the primary caregiver?

Is the mother the natural mother?

Father

Age.

Nationality.

Please state school leaving age.

Please state years at school.

Please state further education.

Please state occupation.

Does the father have a history of physical illness or handicaps?

Does the father have a history of diagnostic psychiatric illness?

Is the father the natural father?

Siblings (if any)

Do the siblings have a history of physical illness or handicaps?

Do the siblings have any history of psychiatric/emotional disorder?

Do the siblings have learning difficulties?

Please state occupation(if adult)

Do the siblings live at home?

COMMUNICATION

Does the child have problems in receptive language?	
Is the child mute?	
If yes, please go to the next section.	
Is the language characterised by spontaneous speech?	
Is the language characterised by utterance of complete sentences?	
Is the language characterised by utterance of single words?	
Is the language characterised by vocal sounds?	*KANNER*
Is the language characterised by naming of objects, persons?	*KANNER*
Is the language characterised by abnormal metaphors?	*KANNER*
Is the language characterised by immediate echolalia?	*KANNER*
Is the language characterised by delayed echolalia?	*KANNER*
Is the language characterised by pronominal reversal (use of 'you' when 'I')?	*KANNER*
Is the language characterised by verbal rituals?	*KANNER*
Is the language characterised by idiosyncratic utterances whose meaning is clear only to those who are familiar with the child's past experiences?	*KANNER*
Is the language characterised by abnormal tone and rhythm in speech?	*DSM-III-R*[3]
Is the language characterised by clear articulation and phonation?	*DSM-III-R*
Does the child understand prompts?	
Does the child understand single words?	
Does the child understand spontaneous speech?	
Does the child use facial expressions?	
Does the child understand facial expressions?	
Does the child use gestures?	*KANNER*
Does the child understand gestures?	

---

[3] DSM-III-R: *Diagnostic and Statistical Manual of Mental Disorders (Third Edition-Revised)* (1987). Washington, DC: American Psychiatric Association.

RELATION TO PEOPLE

Does the child have good eye-contact?	*KANNER*
Does the child smile in social approaches?	*KANNER*
Does the child imitate other people's activity?	
Does the child respond when addressed?	*KANNER*
Does the child show anticipation of being picked up?	*KANNER*
Is the child cuddly?	
Is the child occupied with parts of the other persons' body rather than with the whole person?	*KANNER*
Does the child push people away when they come too close?	*KANNER*
Does the child bite or pinch other people?	
Does the child notice people's coming or leaving?	*KANNER*
Does the child prefer to be alone?	*KANNER*
Does the child initiate communication?	
Does the child relate with the other children?	*KANNER*
Is the child interested in making peer friendships?	
Is the child's play solitary rather than cooperative?	*KANNER*
Is the child's play ritualistic rather than imaginative?	*KANNER*
Does the child show appropriate emotional reactions?	
Does the child come to you seeking comfort when in distress?	*DSM-III-R*
When the child wants something,does he/she take you by the hand to direct you to what he/she wants?	

RELATION TO OBJECTS	
Does the child show unusual use of objects (lines up objects, spins, makes noises, twirls)?	*KANNER*
Does the child show bizarre treatment of objects (e.g. mouthing, smelling)?	*SCREIBMAN*[4] *AND LOVAAS*
Is the child attached to objects (e.g. holds things in hands, takes things to bed)?	*KANNER*
Is the child destructive?	*KANNER*
GENERAL BEHAVIOUR	
Does the child produce repetitive actions?	*KANNER*
Does the child insist on sameness (gets upset by any change of an accustomed pattern)?	*KANNER*
Does the child show self-stimulation behaviour (e.g. hand flapping, rocking, occupied with his body)?	*KANNER*
Is the child overactive to certain sounds or objects?	*KANNER*
Is the child preoccupied with something specific?	*KANNER*
Does the child act as if deaf?	*KANNER*
Does the child show hyperactivity rather than apathy?	
Does the child show self-injurious behaviour?	
Does the child have temper tantrums?	
Does the child show special skills/abilities?	*KANNER*
Is the child good in rote memory?	*NAS*[5]
Is the child good in skills requiring visual-spatial relationships? (e.g. jigsaws, puzzles)	*NAS*
Does the child have abnormalities in eating?	
Does the child have abnormalities in sleeping?	

---

[4] Schreibman, L. and Lovaas, O.I. (1973). Overselective response to social stimuli by autistic children. *Journal of Abnormal Child Psychology*, **1**: 152-168.

[5] National Society for Autistic Children. (1978). National society for autistic children definition of autism. *Journal of Autism and Childhood Schizophrenia*, **8**: 162-167.

II. B.1. SUBJECT SELECTION INVENTORY FOR AUTISTIC CHILDREN

Would you like to participate in a research project on the play and the dyadic communication between mothers and children of preschool age?

(please circle YES or NO)

YES / NO

If YES, please complete the forms below (**QUESTIONNAIRE** and **QUESTIONNAIRE CONSENT**) and if it is possible, return them by .....

If NO, please complete the page 13 of the form **QUESTIONNAIRE** and if it is possible, return it by .....

Please try to respond to every item. If you cannot answer because you do not know about a particular aspect, simply leave the question blank or unscored. Respond as honestly as possible. If you wish to add more information you can use the back side of each sheet. Confidentiality will be kept at all times.

QUESTIONNAIRE

Date of completion ..... / ..... / .....

CHILD

Name: .....

Sex: .....

Date of birth: .....

Age: .....years.....months

How old was your child when you first became upset about his/her behaviour?

.....

Has the child ever been diagnosed as:

1.autistic Yes / No

2.having autistic features Yes / No

3.other diagnosis (please specify) .....

Date that the child received a such diagnosis: ..... / ..... / .....

If 1 or 2 who diagnosed that the child is autistic or has autistic features? (please tick)

[ ] G.P.

[ ] Health Visitor

[ ] Educational Psychologist

[ ] Clinical Psychologist

[ ] Speech Therapist

[ ] Other professional(s) please specify .....

[ ] Family / Friends

[ ] Other(s) please specify .....

Of the above professionals, who confirms that the child is autistic?(please mark with an asterisk)

Please circle any of the above professionals from whom there is a written report.

Would you mind if I obtained a copy of this report? Yes / No

Has the child been 'statemented'? Yes / No

Do you have a copy of the statement of special need? Yes / No

Does the statement mention autism/autistic features? Yes / No

Would you mind if I obtained a copy of the statement? Yes / No

Does the child attend a nursery school? Yes / No

a primary school? Yes / No

If yes, please state Name of the school.....

.....

Frequency of attendance.....

.....

Is the child in treatment? Yes / No

If yes, please state Kind of treatment.....

.....

Place of treatment.....

.....

Frequency of treatment.....

.....

Does the mother or any other member of the family receive training for the management of the child's behaviour? Yes / No

If yes, please give information .....

.....

Ordinal Position of the child in the family: .....

Was the delivery normal? Yes / No

If no, please specify .....

.....

Is the child full-term? Yes / No

If no, please specify .....

.....

Was the child ever thought to be deaf? Yes / No

Has the child a hearing problem now? Yes / No

Does the child have a history of illness or handicaps? Yes / No

If yes, please specify .....

.....

Is any history of neurological abnormality? Yes / No

If yes, please specify .....

.....

Is any history of brain pathology? Yes / No

If yes, please specify .....

.....

Additional Comments: .....

.....

FAMILY

Other children: .....

Age: .....

Sex: .....

Are both parents living with the family? Yes / No

If no, please specify .....

.....

Do other people live within the household? Yes / No

If yes, please specify .....

.....

Does the family belong in a ethnic minority group? Yes / No

If yes, please specify .....

and give information about the language spoken .....

.....

Are any other languages spoken in the household? Yes / No

If yes, please specify .....

.....

Additional Comments: .....

.....

Mother

Age: .....

Nationality: .....

Education: School leaving age .....

Years at school .....

Further education ..... Yes / No

Occupation: .....

Does the mother have a history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Does the mother have a history of diagnostic psychiatric illness? Yes / No

If yes, please specify .....

.....

Is the mother the primary caregiver? Yes / No

If no, please specify .....

.....

Is the mother the natural mother? Yes / No

If no, please specify .....

.....

Additional Comments: .....

.....

Father

Age: .....

Nationality: .....

Education: School leaving age .....

Years at school .....

Further education ..... Yes / No

Occupation: .....

Does the father have a history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Does the father have a history of diagnostic psychiatric illness? Yes / No

If yes, please specify .....

.....

Is the father the natural father? Yes / No

If no, please specify .....

.....

Additional Comments: .....

.....

Siblings (if any)

Do the siblings have a history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Do the siblings have any history of psychiatric / emotional disorder? Yes / No

If yes, please specify .....

.....

Do the siblings have learning difficulties? Yes / No

If yes, please specify .....

.....

Occupation(if adult): .....

Do the siblings live at home? Yes / No

Additional Comments: .....

.....

Please circle the number corresponding to the word which most accurately describes the child's present performance and add any information that you consider appropriate. Each item is followed by a choice of possible responses 1, 2, 3, 4, 5. Read each item carefully and decide which choice best answers the question.

COMMUNICATION

Does the child have problems in receptive language? Yes / No

If yes, please specify .....

.....

Is the child mute? Yes / No

If yes, please go to the next section.

	1.never	2.seldom	3.occasionally	4.usually	5.always
Is the language characterised by :					
spontaneous speech	1	2	3	4	5
utterance of complete sentences	1	2	3	4	5
utterance of single words	1	2	3	4	5
vocal sounds	1	2	3	4	5
naming of objects, persons	1	2	3	4	5
abnormal metaphors	1	2	3	4	5
immediate echolalia	1	2	3	4	5
delayed echolalia	1	2	3	4	5
prenominal reversal (use of 'you' when 'I')	1	2	3	4	5
verbal rituals	1	2	3	4	5
idiosyncratic utterances whose meaning is clear only to those who are familiar with the child's past experiences	1	2	3	4	5
abnormal tone and rhythm in speech	1	2	3	4	5
clear articulation and phonation	1	2	3	4	5

Does the child understand prompts?	1	2	3	4	5
Does the child understand single words?	1	2	3	4	5
Does the child understand spontaneous speech?	1	2	3	4	5
Does the child use facial expressions?	1	2	3	4	5
Does the child understand facial expressions?	1	2	3	4	5
Does the child use gestures?	1	2	3	4	5
Does the child understand gestures?	1	2	3	4	5

Additional Comments: .....

.....

1.never 2.seldom 3.occasionally 4.usually 5.always

RELATION TO PEOPLE

Does the child have good eye-contact?	1	2	3	4	5
Does the child smile in social approaches?	1	2	3	4	5
Does the child imitate other peoples activity?	1	2	3	4	5
Does the child respond when addressed?	1	2	3	4	5
Does the child show anticipation of being picked up?	1	2	3	4	5
Is the child cuddly?	1	2	3	4	5
Is the child occupied with parts of the other persons' body rather than with the whole person?	1	2	3	4	5
Does the child push people away when they come too close?	1	2	3	4	5
Does the child bite or pinch other people?	1	2	3	4	5
Does the child notice people's coming or leaving?	1	2	3	4	5
Does the child prefer to be alone?	1	2	3	4	5
Does the child initiate communication?	1	2	3	4	5

Does the child relate with the other children?	1	2	3	4	5
Is the child interested in making peer friendships?	1	2	3	4	5
Is the child's play solitary rather than cooperative?	1	2	3	4	5
Is the child's play ritualistic rather than imaginative?	1	2	3	4	5
Does the child show appropriate emotional reactions?	1	2	3	4	5
Does the child come to you seeking comfort when in distress?	1	2	3	4	5
When the child wants something, does he/she take you by the hand to direct you to what he/she wants?	1	2	3	4	5

Additional Comments: .....

.....

1.never 2.seldom 3.occasionally 4.usually 5.always

RELATION TO OBJECTS

Does the child show unusual use of objects? (lines up objects, spins, makes noises, twirls)	1	2	3	4	5
Does the child show bizarre treatment of objects? (e.g. mouthing, smelling)	1	2	3	4	5
Is the child attached to objects? (e.g. holds things in hands, takes things to bed)	1	2	3	4	5
Is the child destructive?	1	2	3	4	5

Additional Comments: .....

.....

1.never 2.seldom 3.occasionally 4.usually 5.always

GENERAL BEHAVIOUR

Does the child produce repetitive actions?	1	2	3	4	5
Does the child insist on sameness? (gets upset by any change of an accustomed pattern)	1	2	3	4	5
Does the child show self-stimulation behaviour? (e.g. hand flapping, rocking, occupied with his body)	1	2	3	4	5
Is the child overactive to certain sounds or objects?	1	2	3	4	5
Is the child preoccupied with something specific?	1	2	3	4	5
Does the child act as if deaf?	1	2	3	4	5
Does the child show hyperactivity rather than apathy?	1	2	3	4	5
Does the child show self-injurious behaviour?	1	2	3	4	5
Does the child have temper tantrums?	1	2	3	4	5

Does the child show special skills/abilities? Yes / No

If yes, please specify .....

.....

Is the child good in rote memory? Yes / No

If yes, please specify .....

.....

Is the child good in skills requiring visual-spatial relationships? (e.g. jigsaws, puzzles) Yes / No

If yes, please specify .....

.....

Does the child have abnormalities in eating? Yes / No

If yes, please specify .....

.....

Does the child have abnormalities in sleeping? Yes / No

If yes, please specify .....

.....

Additional Comments: .....

.....

Any other comments on the child or the questionnaire.....

.....

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Many thanks for your help.

Completed by:

Name: .....

Address: .....

.....

.....Tel. No. .....

Please return this form by ..... to:

Ms Despina Papoudi
University of Edinburgh
Department of Psychology
7 George Square
Edinburgh EH8 9JZ

II. B. 2. SUBJECT SELECTION INVENTORY
FOR DEVELOPMENTALLY-DELAYED CHILDREN

Would you like to participate in a research project on play and communication between mothers and children of preschool age?

(please circle YES or NO)

YES / NO

If YES, please complete the forms below (**QUESTIONNAIRE** and **QUESTIONNAIRE CONSENT**) and if it is possible, return them by .....

If NO, please complete the last page of this form and if it is possible, return the form by .....

Please try to respond to every item. If you cannot answer because you do not know about a particular aspect, simply leave the question blank. Respond as honestly as possible. If you wish to add more information you can use the reverse side of each sheet. Confidentiality will be kept at all times.

QUESTIONNAIRE

Date of completion ..... / ..... / .....

CHILD

Name: .....

Sex: .....

Date of birth: .....

Age: .....years.....months

Does your son/daughter attend a nursery school? Yes / No

a primary school? Yes / No

If yes, please state Name of the school.....

.....

Frequency of attendance.....

.....

Is your son/daughter seeing any specialists because of his/her condition? Yes / No

If yes, please state Kind .....

.....

Place .....

.....

Frequency .....

.....

Do you or any other member of the family receive professional guidance in relation to your child's development? Yes / No

If yes, please give information .....

.....

Number of other children in the family: .....

Position of the child in the family (e.g. 2nd born):.....

Was the delivery normal? Yes / No

If no, please specify .....

.....

Was he/she full-term? Yes / No

If no, please specify .....

.....

Has he/she a hearing problem? Yes / No

If yes, please specify .....

.....

Has he/she a sight problem? Yes / No

If yes, please specify .....

.....

Has he/she a speech problem? Yes / No

If yes, please specify .....

.....

Has he/she a problem in motor development? Yes / No

If yes, please specify .....

.....

Is he/she suffering from epilepsy? Yes / No

If yes, please specify .....

.....

Has he/she any other health problems? Yes / No

If yes, please specify .....

.....

Is the cause of the child's handicap known? Yes / No

If yes, please specify .....

.....

Has any neurological abnormality been found? Yes / No

If yes, please specify .....

.....

Is any brain pathology been found? Yes / No / Do not know

If yes, please specify .....

.....

Has a genetic/chromosomal disorder been identified? Yes / No / Do not know

If yes, please specify .....

.....

Additional Comments: .....

.....

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FAMILY

Other children (names):.....

Age: .....

Sex: .....

Are both parents living with the family? Yes / No

If no, please specify .....

.....

Do other people live within the household? Yes / No

If yes, please specify .....

.....

Does the family belong to an ethnic minority group? Yes / No

If yes, please specify .....

and give information about the language spoken in the household.....

.....

Are any other languages spoken in the household? Yes / No

If yes, please specify .....

.....

Mother

Name: .....

Age: .....

Nationality: .....

Education: School leaving age .....

Years at school .....

Further education ..... Yes / No

Occupation: .....

.....

Do you have any history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Do you have a history of emotional/psychiatric illness? Yes / No

If yes, please specify .....

.....

Are you the primary caregiver? (you take the main role in bringing up your child) Yes / No

If no, please specify .....

.....

Are you the natural mother? Yes / No

If no, please specify .....

.....

Father

Name: .....

Age: .....

Nationality: .....

Education: School leaving age .....

Years at school .....

Further education ..... Yes / No

Occupation: .....

.....

Please give details about father's occupation .....

.....

.....

.....

.....

Is he manager? Yes / No

Is he self-employed with employees? Yes / No

Is he self-employed without employees? Yes / No

Is he foreman or supervisor? Yes / No

Is he employee? Yes / No

Does the father have any history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Does the father have a history of emotional/psychiatric illness? Yes / No

If yes, please specify .....

.....

Is the father the natural father? Yes / No

If no, please specify .....

.....

Siblings (if any)

Does any brother/sister have any history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Does any brother/sister have any history of psychiatric/emotional disorder? Yes / No

If yes, please specify .....

.....

Does any brother/sister have learning difficulties? Yes / No

If yes, please specify .....

.....

Occupation(if adult): .....

How many brothers/sisters live at home?.....

Additional comments: .....

.....

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.....

Any other comments on the child or the questionnaire .....

.....

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Many thanks for your help.

Completed by:

Name: .....

Address: .....

.....

.....

..... Tel. No. .....

Please return this form by ..... to:

Ms Despina Papoudi
University of Edinburgh
Department of Psychology
7 George Square
Edinburgh EH8 9JZ

II. B. 3. SUBJECT SELECTION INVENTORY
FOR NON-DEVELOPMENTALLY-DELAYED CHILDREN

Would you like to participate in a research project on play and communication between mothers and children of preschool age?

(please circle YES or NO)

YES / NO

If YES, please complete the forms below (**QUESTIONNAIRE** and **QUESTIONNAIRE CONSENT**) and if it is possible, return them by .....

If NO, please complete the last page of this form and if it is possible, return the form by .....

Please try to respond to every item. If you cannot answer because you do not know about a particular aspect, simply leave the question blank. Respond as honestly as possible. If you wish to add more information you can use the reverse side of each sheet. Confidentiality will be kept at all times.

QUESTIONNAIRE

Date of completion ..... / ..... / .....

CHILD

Name: .....

Sex: .....

Date of birth: .....

Age: .....years.....months

Does your son/daughter attend a nursery school? Yes / No

If yes, please state Name of the school.....

.....

Frequency of attendance.....

.....

Number of other children in the family: .....

Position of the child in the family (e.g. 2nd born):.....

Has he/she a hearing problem? Yes / No

If yes, please specify .....

.....

Has he/she a sight problem? Yes / No

If yes, please specify .....

.....

Has he/she a speech problem? Yes / No

If yes, please specify .....

.....

Has he/she a problem in motor development? Yes / No

If yes, please specify .....

.....

Has he/she any health problems? Yes / No

If yes, please specify .....

.....

Additional Comments: .....

.....

.....

FAMILY

Other children (names):.....

Age: .....

Sex: .....

Are both parents living with the family? Yes / No

If no, please specify .....

.....

Do other people live within the household? Yes / No

If yes, please specify .....

.....

Does the family belong to an ethnic minority group? Yes / No

If yes, please specify .....

and give information about the language spoken in the household.....

.....

Are any other languages spoken in the household? Yes / No

If yes, please specify .....

.....

Mother

Name: .....

Age: .....

Nationality: .....

Education: School leaving age .....

Years at school .....

Further education ..... Yes / No

Occupation: .....

.....

Do you have any history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Do you have a history of emotional/psychiatric illness? Yes / No

If yes, please specify .....

.....

Are you the primary caregiver? (you take the main role in bringing up your child) Yes / No

If no, please specify .....

.....

Are you the natural mother? Yes / No

If no, please specify .....

.....

Father

Name: .....

Age: .....

Nationality: .....

Education: School leaving age .....

Years at school .....

Further education ..... Yes / No

Occupation: .....

.....

Please give details about father's occupation .....

.....

.....

.....

Is he manager? Yes / No

Is he self-employed with employees? Yes / No

Is he self-employed without employees? Yes / No

Is he foreman or supervisor? Yes / No

Is he employee? Yes / No

Does the father have any history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Does the father have a history of emotional/psychiatric illness? Yes / No

If yes, please specify .....

.....

Is the father the natural father? Yes / No

If no, please specify .....

.....

Siblings (if any)

Does any brother/sister have any history of physical illness or handicaps? Yes / No

If yes, please specify .....

.....

Does any brother/sister have any history of psychiatric/emotional disorder? Yes / No

If yes, please specify .....

.....

Does any brother/sister have learning difficulties? Yes / No

If yes, please specify .....

.....

Occupation(if adult): .....

How many brothers/sisters live at home?.....

Additional comments: .....

.....

.....

Any other comments on the child or the questionnaire .....

.....

.....

.....

.....

.....

.....

.....

.....

Many thanks for your help.

Completed by:

Name: .....

Address: .....

.....

.....

..... Tel. No. .....

Please return this form by ..... to:

Ms Despina Papoudi
University of Edinburgh
Department of Psychology
7 George Square
Edinburgh EH8 9JZ

II. C. 1. LETTER SENT TO MOTHERS OF AUTISTIC CHILDREN

Dear .....

Thank you for your interest in my research project.

My name is Despina Papoudi and I am a Ph.D. student in the Department of Psychology, University of Edinburgh. I am interested in play and communication between mothers and children of preschool age.

I would be grateful if you could help in my study. I want to give you some information about it. The main stages of this research are briefly as follows:

1) I would like you to complete a form about your child's and your family's condition (QUESTIONNAIRE is enclosed).

After the completion of the first stage, I will let you know if you have been selected to participate in the second stage. This is only because a homogeneous group must be established and because the number of subjects taking part in the study has to be limited.

2) If you have been selected, I would like to visit you at home, once we have arranged a time suitable for you. The purpose of this visit is:
a) to discuss with you about the family's and the child's background
b) to administer one or two formal psychological tests on your child, just to see his/her abilities in some tasks
c) to film you and your child while you are playing with some toys for approximately 20 minutes and
d) to to ask you to complete a short questionnaire after the filming is finished.

I am aware of the need for confidentiality of this information. I assure you that your privacy will be respected at all times; Names of mothers and children will not be reported. I will ask you to sign an informed consent form for each stage of the study. I enclose a sample of these consent forms (QUESTIONNAIRE CONSENT for the information, TESTS CONSENT for the formal psychological tests, VIDEO CONSENT for the video recording and MAIN STUDY CONSENT for the short questionnaire).

If you like to participate in the research project could you please complete the form **QUESTIONNAIRE** and the consent form **QUESTIONNAIRE CONSENT**. I enclose a stamped addressed envelope for these forms. I will still like you to complete the pages 1 and 13 of the form **QUESTIONNAIRE** and return the form even if you do not want to take part in the research project.

I would be grateful if you could return it by .....

If you decide to join the project and if you have been selected for the second stage further information will be sent. If you have not been selected a letter will be sent.

If you have any queries please do not hesitate to contact me.

Many thanks for your help.

Yours sincerely

Ms Despina Papoudi

II. C. 2. LETTER SENT TO MOTHERS OF DEVELOPMENTALLY-DELAYED CHILDREN

Dear .....

Mr/Mrs.....has informed me that he/she has discussed my research project with you and that you may be interested in taking part.

I enclose further information on the study for you to look over, a questionnaire to fill in and a consent form for you to sign and to send back if you wish to.

My name is Despina Papoudi and I am a Ph.D. student in the Department of Psychology, University of Edinburgh. I am interested in interaction between mothers and children of preschool age.

I would be grateful if you could help in my study. I want to give you some information about it. The main stages of this research are briefly as follows:

1) I would like you to complete a form about your child's and your family's condition (QUESTIONNAIRE is enclosed).

After completion of the first stage I will let you know if you have been selected to participate in the second stage. The number of children taking part in the second stage of the study has to be limited for research purposes. It is no reflection on your child's condition or on the help you have already given if you are not chosen for this later stage although I realise that you may be disappointed not to be able to complete all parts of the study. If you are not selected for stage 2 the information you have given in the questionnaire will still be used and will be invaluable to the final results of the research.

2) If you have been selected to take part in the second stage, I would like to visit you at home on several occasions at times suitable for you. The purpose of these visits is:
a) to discuss with you about the family's and the child's background
b) to administer two tasks to explore your child's abilities
c) to film you and your child while you are playing with some toys provided by the researcher for 20 minutes approximately and
d) to ask you to complete a short questionnaire after the filming is finished.

I am aware of the need for confidentiality of this information. I assure you that your privacy will be respected at all times.

Your desicion to participate or not in the study will not have any effect on the medical treatment of your child.

Names of mothers and children will not be reported. I will ask you to sign an informed consent form for each stage of the study. I enclose a sample of these consent forms (QUESTIONNAIRE CONSENT for the information in the questionnaire, TASKS-VIDEO-MAIN STUDY CONSENT for the ability tasks, the video recording(s) and the short questionnaire).

When the video recording is finished and you are aware of the content of the tapes you will be asked to give your consent once more (VIDEO CONSENT).

If you are willing to participate in the research project could you please complete the form **QUESTIONNAIRE** and the consent form **QUESTIONNAIRE CONSENT**. I enclose a stamped addressed envelope for these forms. I would still like you to complete pages the first and the last page of the form **QUESTIONNAIRE** and return the form even if you do not want to take part in the research project. This is to let me know that you

want your name removed from my list so that you will not be contacted again.

I would be grateful if you could return it by .....

If you decide to join the project and if you have been selected for the second stage further information will be sent.

Should you have any further questions, please feel free to contact me on .....

I hope that you will find joining my research programme to be of interest to you and of benefit to your child. I also hope that the results will be of benefit to other children and their parents in the future.

Many thanks for your help.

Yours sincerely

Ms Despina Papoudi

II. C. 3. LETTER SENT TO MOTHERS OF NON-DEVELOPMENTALLY-DELAYED CHILDREN

Dear .....

My name is Despina Papoudi and I am a Ph.D. student in the Department of Psychology, University of Edinburgh. I am interested in interaction between mothers and children of preschool age.

I would be grateful if you could help in my study. I want to give you some information about it. The main stages of this research are briefly as follows:

1) I would like you to complete a form about your child and your family (QUESTIONNAIRE is enclosed).

After the completion of the first stage, I will let you know if you have been selected to participate in the second stage. This is because I want to study children who have similar backgrounds to some children whom I studied previously.

2) If you have been selected, I would like to visit you at home on several occasions (approximately three) at times suitable for you. The purpose of these visits is:
a) to discuss with you about the family's and the child's background
b) to administer two tasks to explore your child's abilities
c) to film you and your child while you are playing with some toys provided by the researcher for 20 minutes approximately and
d) to ask you to complete a short questionnaire after the filming is finished.

I am aware of the need for confidentiality of this information. I assure you that your privacy will be respected at all times. The names of the families will only be known to me.

Names of mothers and children will not be reported. I will ask you to sign an informed consent form for each stage of the study. I enclose a sample of these consent forms (QUESTIONNAIRE CONSENT for the information in the questionnaire, TASKS-VIDEO-MAIN STUDY CONSENT for the ability tasks, the video recording and the short questionnaire).

When the video recording is finished and you are aware of the content of the tape you will be asked to give your consent once more (VIDEO CONSENT).

If you are willing to participate in the research project could you please complete the form **QUESTIONNAIRE** and the consent form **QUESTIONNAIRE CONSENT**. I enclose a stamped addressed envelope for these forms. I would still like you to complete the first and the last pages of the form **QUESTIONNAIRE** and return the form even if you do not want to take part in the research project. This is to let me know that you want your name removed from my list so that you will not be contacted again.

I would be grateful if you could return it by .....

If you decide to join the project and if you have been selected for the second stage further information will be sent.

If you have any queries please do not hesitate to contact me.

Many thanks for your help.

Yours sincerely

Ms Despina Papoudi

II. C. 4. LETTER SENT TO MOTHERS OF AUTISTIC CHILDREN WHO WERE NOT SELECTED TO PARTICIPATE IN THE MAIN STUDY

Dear .....

Thank you very much for completing my questionnaire and offering to take part in my study.

As I mentioned earlier, I am only able to study a limited number of children in the second stage of my research.

I am writing to inform you that you have not been selected to participate in the second stage of my study. This is no reflection on your child or on the help that you have already given although I realise you may be disappointed not to be able to complete all parts of the study.

I hope that you found joining my research programme to be of interest to you. I also hope that the results will be of benefit to other children and their parents in the future.

Yours sincerely

Ms Despina Papoudi

II. D. 1. A. QUESTIONNAIRE CONSENT FOR AUTISTIC CHILDREN

I agree that the information about

(please circle Yes or No)

my family	Yes / No
and my child	Yes / No

can be used for

the Ph.D. research	Yes / No
publications, lectures, seminars and discussion with professional colleagues	Yes / No

This information is collected through a questionnaire which is completed by me during a research project for a Ph.D. thesis.

Names of mothers and children will not be reported. My consent can be withdrawn at any time and any part of the information can be deleted at my request.

Name _____

Signature _____

Date _____

II. D. 1. B. TESTS CONSENT FOR AUTISTIC CHILDREN

I agree that the information derived from the administration of formal psychological tests during a research project for a Ph.D. thesis can be used for

(please circle Yes or No)

the Ph.D. research Yes / No

publications, lectures, seminars and discussion with professional colleagues Yes / No

Names of mothers and children will not be reported. My consent can be withdrawn and any part of the information can be deleted at my request.

Name _____

Signature _____

Date _____

II. D. 1. C. VIDEO CONSENT FOR AUTISTIC CHILDREN

I agree that the video recordings made during a research project for a Ph.D. thesis can be used for

(please circle Yes or No)

the Ph.D. research Yes / No

publications, lectures, seminars and discussion with professional colleagues Yes / No

Names of mothers and children will not be reported. My consent can be withdrawn and any part of the information can be deleted at my request.

Name _____

Signature _____

Date _____

II. D. 1. D. MAIN STUDY CONSENT FOR AUTISTIC CHILDREN

I agree that the information derived from the short questionnaire can be used for

(please circle Yes or No)

the Ph.D. research Yes / No

publications, lectures, seminars and discussion with professional colleagues Yes / No

This information is collected through a scale which is completed by me during a research project for a Ph.D. thesis.

Names of mothers and children will not be reported. My consent can be withdrawn and any part of the information can be deleted at my request.

Name _____

Signature _____

Date _____

II. D. 2. A. QUESTIONNAIRE CONSENT FOR DEVELOPMENTALLY-DELAYED AND NON-DEVELOPMENTALLY-DELAYED CHILDREN

I agree that the information about

(please circle Yes or No)

my family	Yes / No
and my child	Yes / No

can be used for

the Ph.D. research	Yes / No
publications, lectures, seminars and discussion with professional colleagues	Yes / No

This information is collected through a questionnaire which is completed by me during a research project for a Ph.D. thesis.

Names of mothers and children will not be reported. My consent can be withdrawn at any time and any part of the information can be deleted at my request.

Name _____

Signature _____

Date _____

II. D. 2. B. TASKS-VIDEO-MAIN STUDY CONSENT FOR DEVELOPMENTALLY-DELAYED AND NON-DEVELOPMENTALLY-DELAYED CHILDREN

I agree that the information derived from

a. the administration of the ability tasks
b. the video recording(s)
c. the completion of a short questionnaire

during a research project for a Ph.D. thesis can be used for

the Ph.D. research	Yes / No
publications, lectures, seminars and discussion with professional colleagues	Yes / No

Names of mothers and children will not be reported. My consent can be withdrawn at any time and any part of the information can be deleted at my request.

Name _____

Signature _____

Date _____

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